MDI-118 Series
MDI-112 Series

User's Manual

Industrial Managed

Ethernet Switch

©Westermo Teleindustri AB

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Copyright Notice

Copyright © 2010 Westermo Technology Co., Ltd.

All rights reserved.

Reproduction in any form or by any means without permission is prohibited.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his expense.

The user is cautioned that changes and modifications made to the equipment without approval of the manufacturer could void the user's authority to operate this equipment.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Index

1 Introduction 2
1.1 Overview 2
1.2 Major Features 2
1.3 Package List 3
2 Hardware Installation 4
2.1 Hardware Introduction 4
2.2 Wiring Power Inputs 5
2.3 Wiring Digital Output 6
2.4 Wiring Earth Ground 6
2.5 Wiring Fast Ethernet Ports 7
2.6 Wiring Fiber Ports 8
2.7 Wiring Gigabit Combo Ports 8
2.8 Wiring RS-232 Console Cable 8
2.9 DIN-Rail Mounting Installation 8
2.10 Wall Mounting Installation 10
2.11 Safety Warming 11
3 Preparation for Management 12
3.1 Preparation for Serial Console 12
3.2 Preparation for Web Interface 13
3.3 Preparation for Telnet Console 15
4 Feature Configuration 18
4.1 Command Line Interface Introduction 19
4.2 Basic Setting 24
4.3 Port Configuration 42
4.4 Network Redundancy 53
4.5 VLAN 64
4.6 Traffic Prioritization 74
4.7 Multicast Filtering 81
4.8 SNMP 87
4.9 Security 91
4.10 Warning 106
4.11 Monitor and Diag 117
4.12 Device Front Panel 127
4.13 Save to Flash 128
4.14 Logout 129

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

5 Appendix 130
5.1 Pin Assignment of the RS-232 Console Cable 130
5.2 Private MIB 131
5.3 Revision History 132

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

1 Introduction

Welcome to MDI-118/MDI-112 Series Industrial Managed Ethernet Switch User Manual. Following topics are covered in this chapter:

1.1 Overview

1.2 Major Features

1.3 Package Checklist

1.1 Overview

The MDI-118-F2G is equipped with 16 10/100TX Fast Ethernet ports and 2 1000Base-T/Gigabit SFP combo ports. The MDI-112-F4G is equipped with 8 10/100TX Fast Ethernet ports, 2 Gigabit SFP and 2 1000Base-T/Gigabit SFP Combo ports. The SFP ports of the 2 models accept all types of Gigabit SFP transceivers, including Gigabit SX, LX, LHX, ZX and XD for several connections and distances.

The embedded software supports RSTP and Multiple Super Ring technology for ring redundancy protection. Besides, the switch support full layer 2 management features, such as the VLAN, IGMP Snooping, LACP for network control, SNMP, LLDP for network management. The secured access is protected by Port Security, 802.1x and flexible Layer 2/4 Access Control List. The switch can work with network management system which can draw the network topology, automatically update ring and port status, remotely manage the switch or monitor its status through LLDP and SNMP protocols. With the MDI-118/112 series you can fulfill the technicians' needs of having the best solution for the industrial Ethernet infrastructure.

1.2 Major Features

The following are the major features:

- MDI-118-F2G has 16 10/100-TX and 2 Gigabit RJ-45/SFP combo ports (10/100/1000 Base-TX, 1000Base-X)
- MDI-112-F4G has 8 10/100-TX, 2 Gigabit SFP and 2 Gigabit RJ-45/SFP combo ports (10/100/1000 Base-TX, 1000Base-X)
- Non-Blocking Switching Performance, high backplane single chip solution
- Multiple Super Ring pattern aggregates multiple rings within one unit
- IEEE 1588 Precision Time Protocol for precise time synchronization

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

- Jumbo Frame up to 9,216 byte
- RSTP/STP, 256 802.1Q VLAN, QoS and up to 6/8 trunk groups
- IGMP Snooping, GMRP Rate Control for multicast message management
- LLDP for network topology live update
- SNMP V1/V2c/V3, RMON for remote management
- Works with Network Management Systems
- Advanced Security supports IP/Port Security, 802.1x and Access Control List
- Dual 12-48VDC power inputs

1.3 Package List

The product is shipped with following items:

The switch (no SFP transceivers)

Wall Mount Kit

Console Cable

Quick Installation Guide

Document CD

If any of the above items are missing or damaged, please contact your local sales representative.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

2 Hardware Installation

This chapter includes hardware introduction, installation and configuration information.

Following topics are covered in this chapter:

2.1 Hardware Introduction

Dimension

Panel Layout

Bottom View

2.2 Wiring Power Inputs

2.3 Wiring Digital Input

2.4 Wiring Relay Output

2.5 Wiring Ethernet Ports

2.6 Wiring Combo Ports

2.7 Wiring RS-232 console cable

2.8 DIN-Rail Mounting Installation

2.9 Wall-Mounting Installation

2.10 Safety Warming

2.1 Hardware Introduction

LED

Diagnostic LED:

System: Power 1, Power 2, Ring Master (Green), Relay 1, Relay 2, Ring Failure (Red)

10/100 RJ-45: Link (Green/Left), Activity (Yellow Blinking/Right)

1000Base-T RJ-45: 10/100/1000 Link (Green/Left), Full Duplex (Yellow/Right), Activity (Green Blinking)

Gigabit SFP: Link/Activity (Green/Green Blinking)

Dimension

The switch dimension (W x H x D) is **137mm(H) x 96mm (W) x 129mm (D)**

Figure of MDI-118-F2G

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

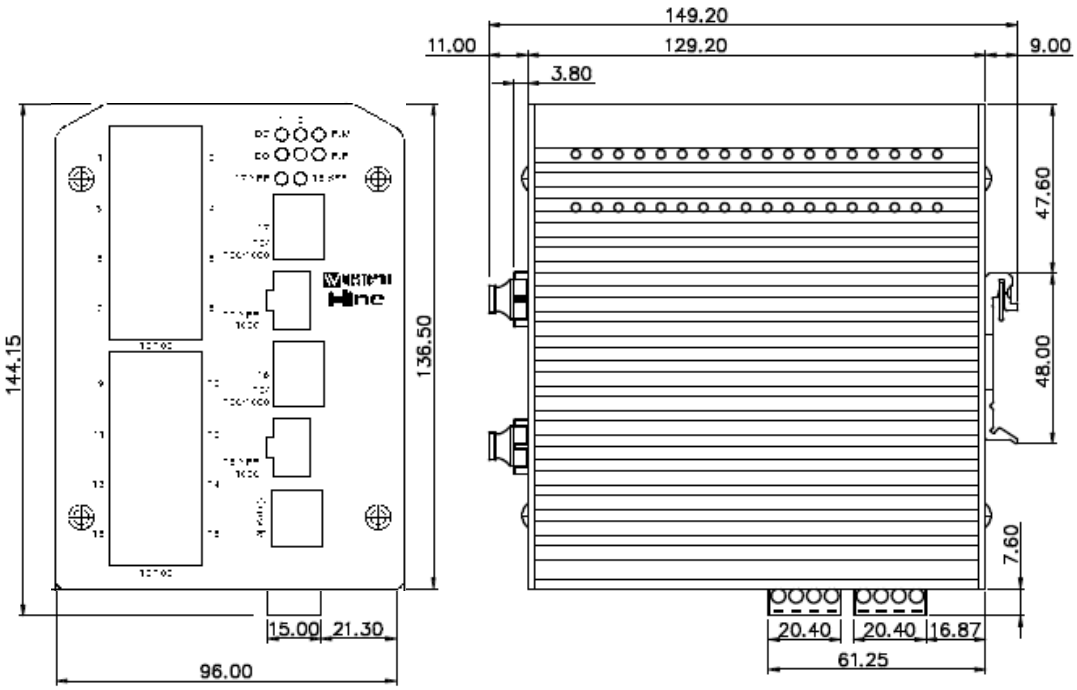
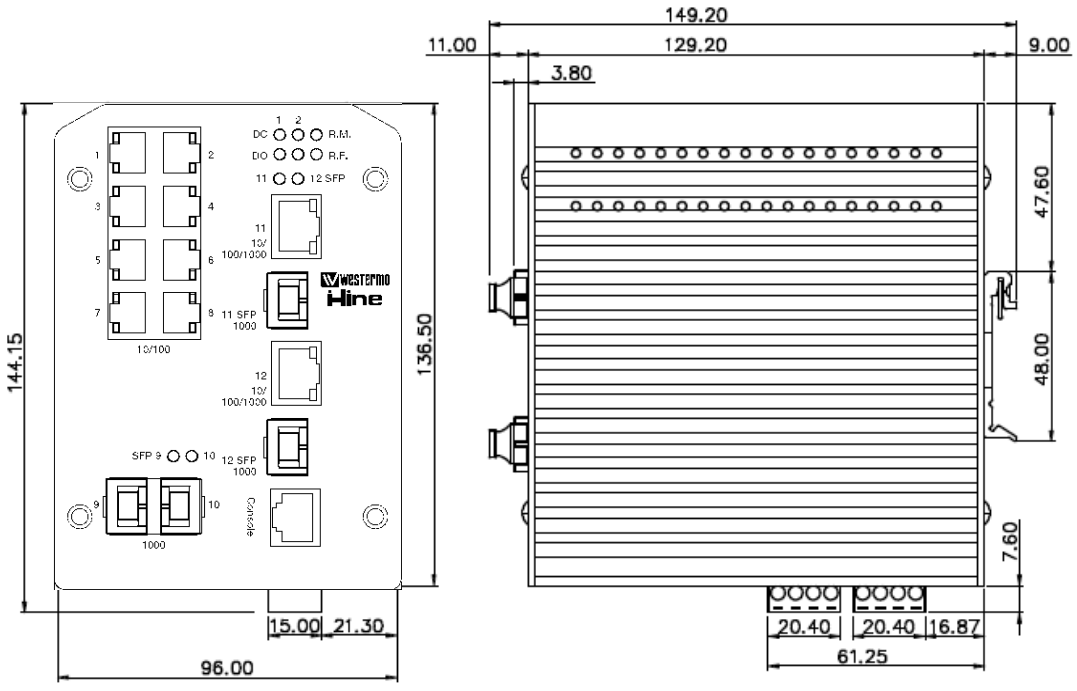


Figure of MDI-112-F4G

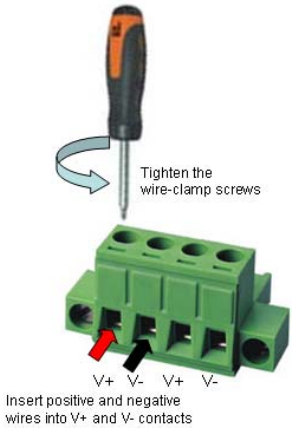


2.2 Wiring Power Inputs

DC Power Input

Follow below steps to wire the redundant DC power inputs.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



1. Insert positive and negative wires into V+ and V- contacts respectively of the terminal block connector
2. Tighten the wire-clamp screws to prevent DC wires from being loosened.
3. Power 1 and Power 2 support power redundancy and polarity reverse protection functions.
4. Positive and negative power system inputs are both accepted, but Power 1 and Power 2 must apply the same mode.

Note 1: It is a good practice to turn off input and load power, and to unplug power terminal block before making wire connections. Otherwise, your screwdriver blade can inadvertently short your terminal connections to the grounded enclosure.

Note 2: The range of the suitable DC electric wire is from 12 to 24 AWG.

Note 3: If the 2 power inputs are connected, the switch will be powered from the highest connected voltage. The unit will alarm for loss of power, either PWR1 or PWR2.

2.3 Wiring Digital Output

The switch provides 2 digital outputs, also known as Relay Output. The relay contacts are energized (open) for normal operation and will close for fault conditions. The fault conditions include power failure, Ethernet port link break or other pre-defined events which can be configured in management UI.

The default (without power) state of the Digital Output is normal **CLOSE** state. The ON/OFF states are controlled by software configuration.

Wiring digital output is exactly the same as wiring power input introduced in chapter 2.2.

2.4 Wiring Earth Ground

To ensure the system will not be damaged by noise or any electrical shock, we suggest you to make exact connection with switch with Earth Ground.

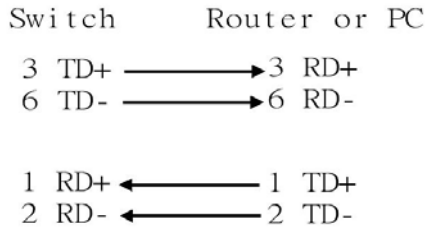
For DC input, loosen the earth ground screw by screw drive; then tighten the screw after earth ground wire is connected.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

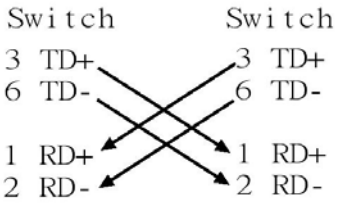
2.5 Wiring Fast Ethernet Ports

The fast Ethernet ports support 10Base-T and 100Base-TX, full or half duplex modes. All the fast Ethernet ports will auto-detect the signal from connected devices to negotiate the link speed and duplex mode. Auto MDI/MDIX allows users to connect another switch, hub or workstation without changing straight through or crossover cables.

Note that crossover cables simply cross-connect the transmit lines at each end to the received lines at the opposite end.



Straight-through Cabling Schematic



Cross-over Cabling Schematic

Note that Ethernet cables use pins 1, 2, 3, and 6 of an 8-pin RJ-45 connector. The signals of these pins are converted by the automatic MDI-X function, as shown in the table below:

Pin MDI-X	Signals	MDI Signals
1	RD+	TD+
2	RD-	TD-
3	TD+	RD+
6	TD-	RD-

Connect one side of an Ethernet cable into any switch port and connect the other side to your attached device. The LNK LED will light up when the cable is correctly connected. Refer to the **LED Indicators** section for descriptions of each LED indicator. Always make sure that the cables between the switches and attached devices (e.g. switch, hub, or workstation) are less than 100 meters (328 feet).

The wiring cable types are as below.

10Base-T: 2-pair UTP/STP Cat. 3, 4, 5 cable, EIA/TIA-568 100-ohm (100m)

100 Base-TX: 2-pair UTP/STP Cat. 5 cable, EIA/TIA-568 100-ohm (100m)

1000 Base-TX: 4-pair UTP/STP Cat. 5 cable, EIA/TIA-568 100-ohm (100m)

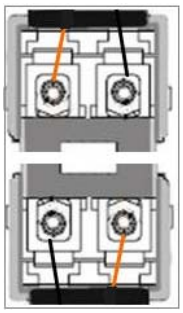
Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

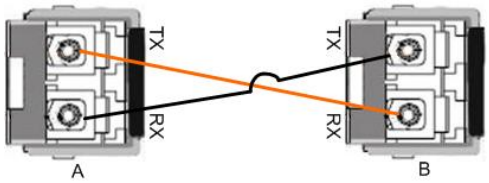
2.6 Wiring Fiber Ports

Small Form-factor Pluggable (SFP)

The SFP ports accept standard MINI GBIC SFP transceiver. To ensure the system reliability, it is recommended to use the approved Gigabit SFP Transceiver. The web UI will show Unknown vendor type when choosing the SFP which is not approved.

The way to connect the SFP transceiver is to Plug in SFP fiber transceiver fist. Cross-connect the transmit channel at each end to the receive channel at the opposite end as illustrated in the figure below.





Note: This is a Class 1 Laser/LED product. Don't stare at the Laser/LED Beam.

2.7 Wiring Gigabit Combo Ports

The switch includes RJ-45 Gigabit Combo ports. The speed of the gigabit Ethernet copper port supports 10Base-T, 100Base-TX and 1000Base-TX. The speed of the SFP port supports 1000Full Duplex.

2.8 Wiring RS-232 Console Cable

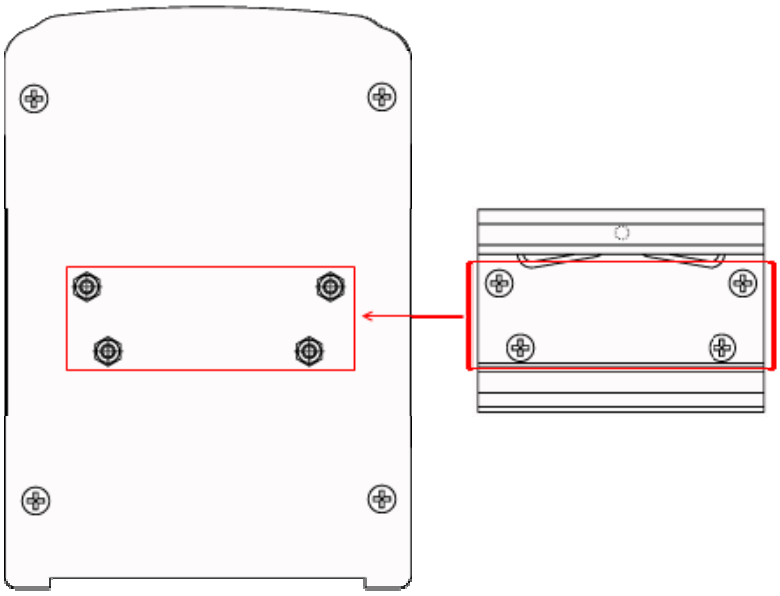
The switch attaches one RS-232 DB-9 to RJ-45 cable in the box. Connect the RJ-45 connector to the COM port of your PC, open Terminal tool and set up serial settings to 9600, N,8,1. (Baud Rate: 9600 / Parity: None / Data Bit: 8 / Stop Bit: 1) Then you can access CLI interface by console able.

Note: If you lost the cable, please contact with your sales or follow the pin assignment to buy a new one. The Pin assignment spec is listed in the appendix.

2.9 DIN-Rail Mounting Installation

The DIN-Rail clip is already attached to the Switch when packaged. If the DIN-Rail clip is not screwed on the Switch, follow the instructions and the figure below to attach DIN-Rail clip to the switch.

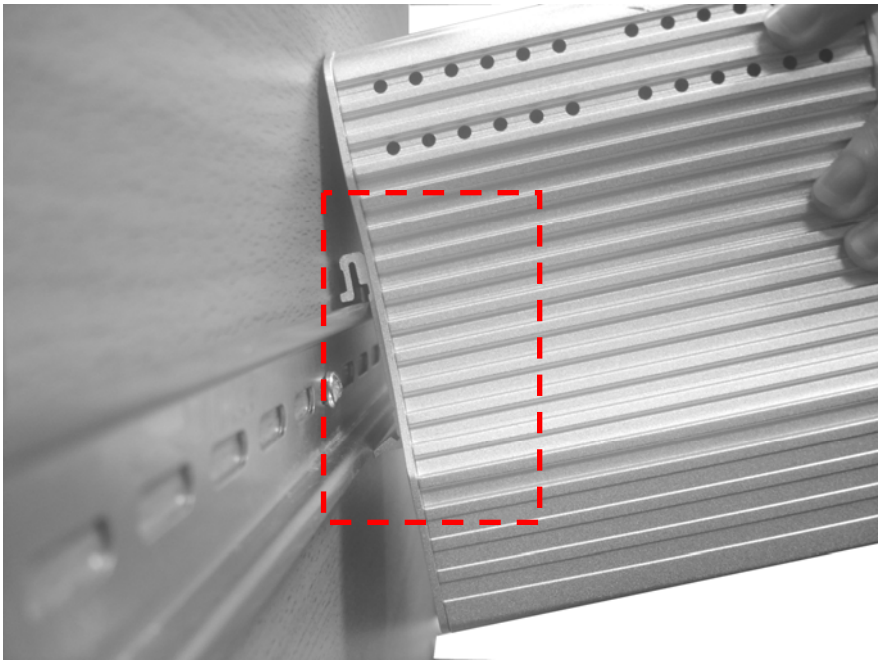
Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



1. Use the screws to attach DIN-Rail clip to the real panel
2. To remove DIN-Rail clip, reverse step 1.

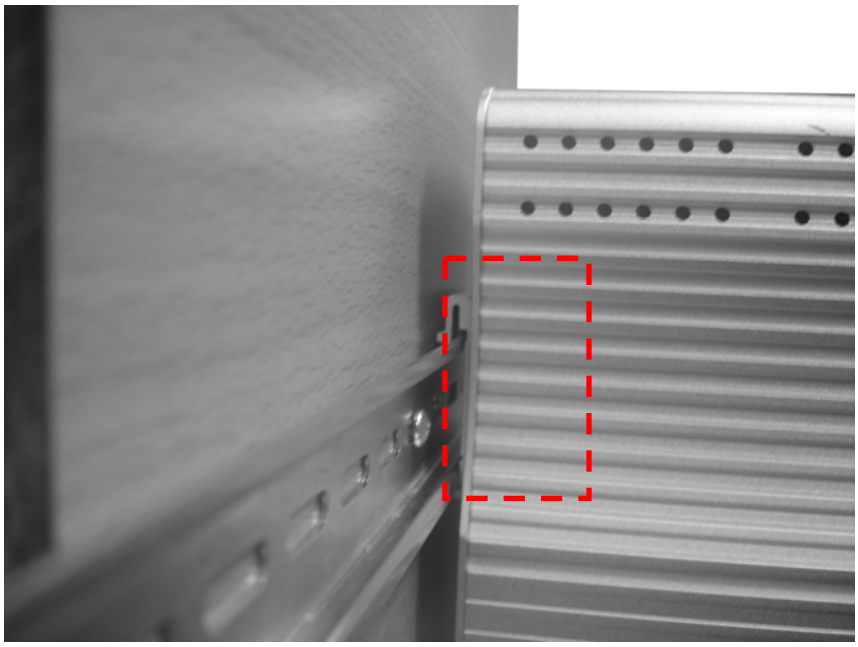
Follow the steps below to mount the wwitch to the DIN-Rail track:

1. First, insert the upper end of DIN-Rail clip into the back of DIN-Rail track from its upper side.



2. Lightly push the bottom of DIN-Rail clip into the track.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



3. Check if DIN-Rail clip is tightly attached on the track.
4. To remove the switch from the track, reverse the steps above.

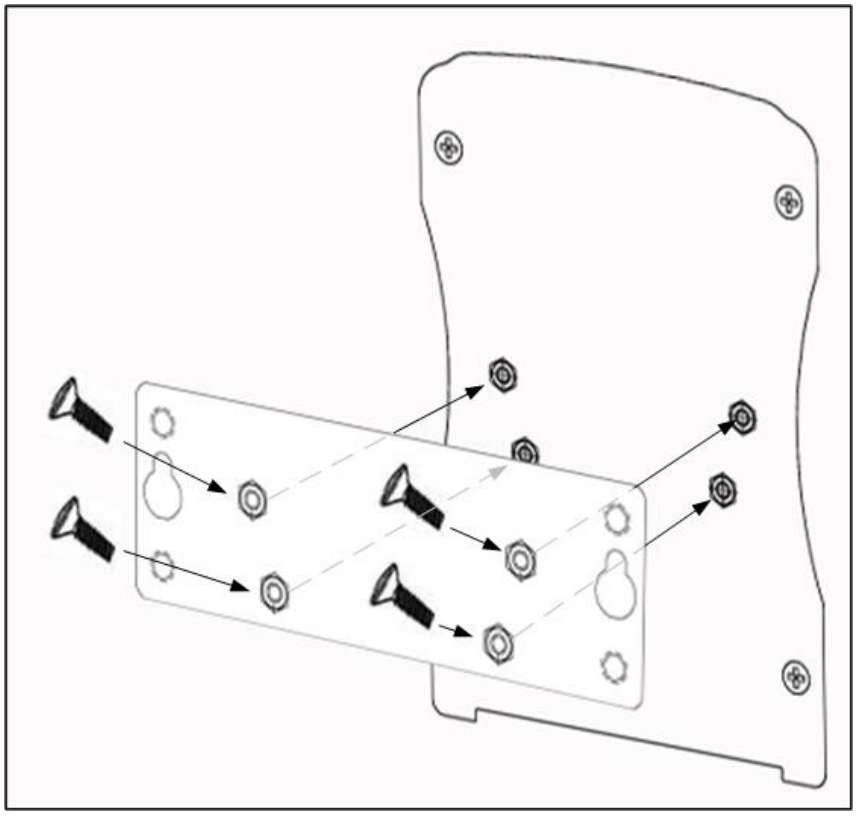
2.10 Wall Mounting Installation

Follow the steps below to install the switch with the wall mounting plate.

1. To remove DIN-Rail clip from the switch, loosen the screws from DIN-Rail clip.
2. Place the wall mounting plate on the rear panel of the switch.
3. Use the screws to tighten the wall mounting plate onto the switch.
4. Use the hook holes at the corners of the wall mounting plate to hang the switch onto the wall.
5. To remove the wall mounting plate, reverse the steps above.

Wall-Mounting plate and screws.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



2.11 Safety Warming

The Equipment intended for installation in a Restricted Access Location.

Restricted Access Location:

This equipment is intended to be installed in a RESTRICTED ACCESS LOCATION only.

The warning test is provided in user manual. Below is the information:

”For tilslutning af de ovrige ledere, se medfolgende installationsvejledning”.

“Laite on liitettava suojamaadoitus-koskettimilla varustettuun pistorasiaan”

„Apparatet ma tilkoples jordet stikkontakt“

”Apparaten skall anslutas till jordat uttag”

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

3 Preparation for Management

The switch provides both in-band and out-band configuration methods. You can configure the switch via RS232 console cable if you don't attach your admin PC to your network, or if you lose network connection to your switch. This is so-called out-band management. It wouldn't be affected by network performance.

The in-band management means you can remotely manage the switch via the network. You can choose Telnet or Web-based management. You just need to know the device's IP address and you can remotely connect to its embedded HTTP web pages or Telnet console.

Should you forget the IP address, you can use WeDashboard to discover the device, check its IP address or assign new IP address. The WeDashboard can discover the device across the subnet.

Following topics are covered in this chapter:

3.1 Preparation for Serial Console

3.2 Preparation for Web Interface

3.3 Preparation for Telnet console

3.1 Preparation for Serial Console

In the package, there is one RS-232 DB-9 to DB-9/RJ-45 console cable. Please attach RS-232 DB-9 connector to your PC COM port, connect the other end to the Console port of the switch. If you lose the cable, please follow the console cable PIN assignment to find one. (Refer to the appendix).

1. Go to Start -> Program -> Accessories -> Communication -> Hyper Terminal
2. Give a name to the new console connection.
3. Choose the COM name
4. Select correct serial settings. The serial settings of The switch are as below:
   Baud Rate: 9600 / Parity: None / Data Bit: 8 / Stop Bit: 1
5. After connected, you can see Switch login request.
6. Login the switch. The default username is "admin", password, "westermo".

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

```
Switch login: admin
Password:

The switch (version 2.3-20101014-11:04:13).

Switch>
```

3.2 Preparation for Web Interface

The switch provides HTTP Web Interface and Secured HTTPS Web Interface for web management.

3.2.1 Web Interface

Web management page is developed by JAVA. It allows you to use a standard web-browser such as Microsoft Internet Explorer, or Mozilla, to configure and interrogate the switch from anywhere on the network.

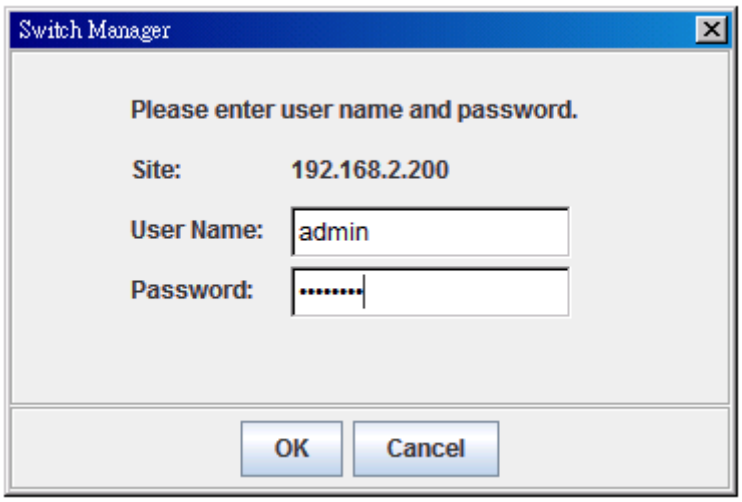
Before you attempt to use the embedded web interface to manage switch operation, verify that the switch is properly installed on your network and that every PC on this network can access the switch via the web browser.

1. Verify that your network interface card (NIC) is operational, and that your operating system supports TCP/IP protocol.
2. Wire DC power to the switch and connect your switch to your computer.
3. Make sure that the switch default IP address is 192.168.20.200.
4. Change your computer IP address to 192.168.20.2 or other IP address which is located in the 192.168.20.x (Network Mask: 255.255.255.0) subnet.
5. Switch to DOS command mode and ping 192.168.20.200 to verify a normal response time.

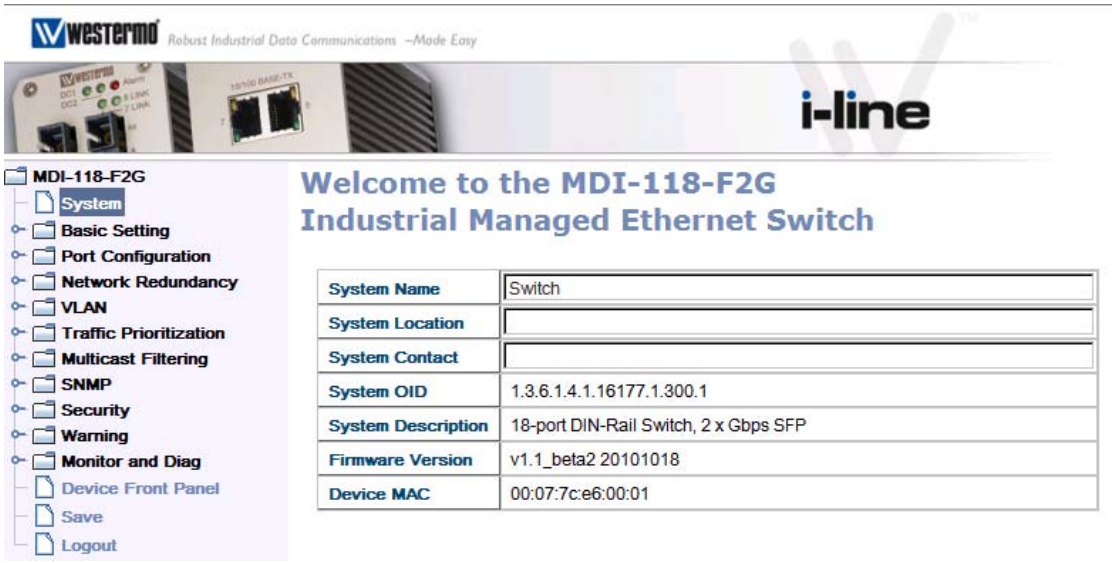
Launch the web browser and Login.

6. Launch the web browser (Internet Explorer or Mozilla Firefox) on the PC.
7. Type **http://192.168.20.200** (or the IP address of the switch). And then press **Enter**.
8. The login screen will appear next.
9. Key in user name and the password. Default user name and password are both **admin**.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



Click on **Enter** or **OK**. Welcome page of the web-based management interface will then appear.



Once you enter the web-based management interface, you can freely change the IP address to fit your network environment.

Note 1: IE 5.0 or later versions do not allow Java applets to open sockets by default. Users have to directly modify the browser settings to selectively enable Java applets to use network ports.

Note 2: The Web UI connection session will be logged out automatically if you don't give any input after 30 seconds. After logged out, you should re-login and key in correct user name and password again.

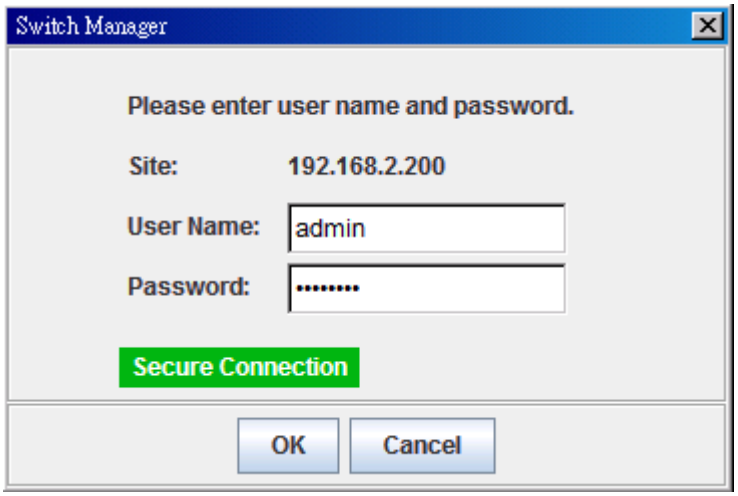
Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

3.2.2 Secured Web Interface

Web management page also provides secured management HTTPS login. All the configuration commands will be secured and will be hard for the hackers to sniff the login password and configuration commands.

Launch the web browser and Login.

1. Launch the web browser (Internet Explorer or Mozilla Firefox) on the PC.
2. Type **https://192.168.20.200** (or the IP address of the switch). And then press **Enter**.
3. The popup screen will appear and request you to trust the secured HTTPS connection. Press **Yes** to trust it.
4. The login screen will appear next.



5. Key in the user name and the password. The default user name is admin and password is westermo.
6. Click on **Enter** or **OK.** Welcome page of the web-based management interface will then appear.
7. Once you enter the web-based management interface, all the commands you see are the same as what you see by HTTP login.

3.3 Preparation for Telnet Console

3.3.1 Telnet

The switch supports Telnet console. You can connect to the switch by Telnet and the command lines are the same as what you see by RS232 console port. Below are the steps to open Telnet connection to the switch.

1. Go to Start -> Run -> cmd. And then press **Enter**
2. Type the **Telnet 192.168.20.200** (or the IP address of the switch). And then press **Enter**

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

3.3.2 SSH (Secure Shell)

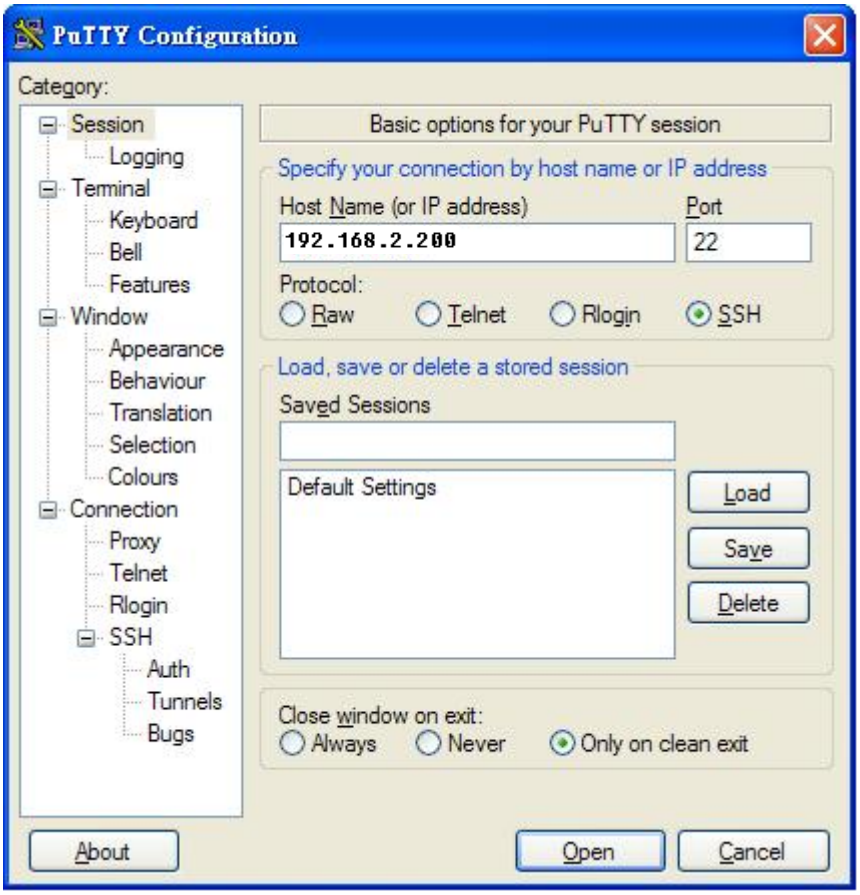
The switch also support SSH console. You can remotely connect to the switch by command line interface. The SSH connection can secure all the configuration commands you sent to the switch.

SSH is a client/server architecture while the switch is the SSH server. When you want to make SSH connection with the switch, you should download the SSH client tool first.

SSH Client: There are many free, sharewares, trials or charged SSH clients you can find on the internet. Fox example, PuTTY is a free and popular Telnet/SSH client. We'll use this tool to demonstrate how to login by SSH.

1. Open SSH Client/PuTTY

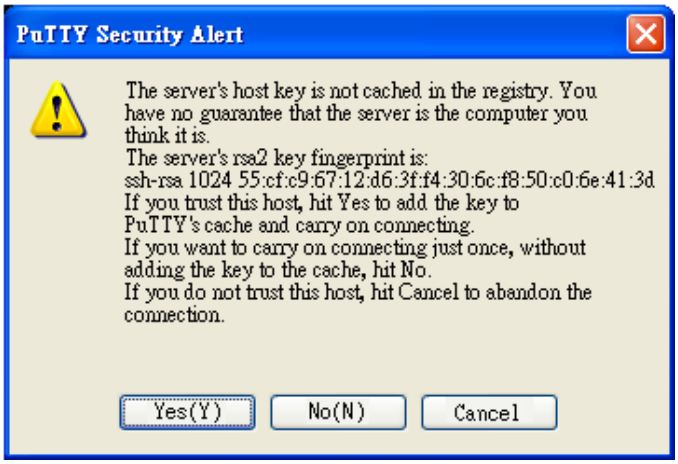
In the **Session** configuration, enter the **Host Name** (IP Address of your The switch) and **Port number** (default = 22). Choose the "**SSH**" protocol. Then click



on "**Open**" to start the SSH session console.

2. After click on **Open**, then you can see the cipher information in the popup screen. Press **Yes** to accept the Security Alert.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com


PuTTY Security Alert
The server's host key is not cached in the registry. You have no guarantee that the server is the computer you think it is.
The server's rsa2 key fingerprint is:
ssh-rsa 1024 55:cf:c9:67:12:d6:3f:f4:30:6c:f8:50:c0:6e:41:3d
If you trust this host, hit Yes to add the key to PuTTY's cache and carry on connecting.
If you want to carry on connecting just once, without adding the key to the cache, hit No.
If you do not trust this host, hit Cancel to abandon the connection.
Yes(Y)
No(N)
Cancel

3. After few seconds, the SSH connection is opened.
4. Type the Login Name and its Password. The default Login Name and Password are **admin / westermo**.

5. All the commands you see in SSH are the same as the CLI commands you see via RS232 console. The next chapter will introduce in detail how to use command line to configure the switch.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4 Feature Configuration

This chapter explains how to configure the software features. There are four ways to access the switch: Serial console, Telnet, Web browser and SNMP.

Following topics are covered in this chapter:

4.1 Command Line Interface (CLI) Introduction
4.2 Basic Setting
4.3 Port Configuration
4.4 Network Redundancy
4.5 VLAN
4.6 Traffic Prioritization
4.7 Multicast Filtering
4.8 SNMP
4.9 Security
4.10 Warning
4.11 Monitor and Diagnose
4.12 Device Front Panel
4.13 Save
4.14 Logout

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.1 Command Line Interface Introduction

The Command Line Interface (CLI) is the user interface to the switch's embedded software system. You can view the system information, show the status, configure the switch and receive a response back from the system by keying in a command.

There are some different command modes. Each command mode has its own access ability, available command lines and uses different command lines to enter and exit. These modes are User EXEC, Privileged EXEC, Global Configuration, (Port/VLAN) Interface Configuration modes.

User EXEC mode: As long as you login the switch by CLI. You are in the User EXEC mode. You can ping, telnet remote device, and show some basic information.

Type **enable** to enter next mode, **exit** to logout. **?** to see the command list

```
Switch>
  enable      Turn on privileged mode command
  exit        Exit current mode and down to previous mode
  list        Print command list
  ping        Send echo messages
  quit        Exit current mode and down to previous mode
  show        Show running system information
  telnet      Open a telnet connection
  traceroute  Trace route to destination
```

Privileged EXEC mode: Press enable in the User EXEC mode, then you can enter the Privileged EXEC mode. In this mode, the system allows you to view current configuration, reset default, reload switch, show system information, save configuration…and enter the global configuration mode.

Type **configure terminal** to enter next mode, **exit** to leave. **?** to see the command list

```
Switch#
  archive     manage archive files
  clear       Reset functions
  clock       Configure time-of-day clock
  configure   Configuration from vty interface
  copy        Copy from one file to another
  debug       Debugging functions (see also 'undebug')
  disable     Turn off privileged mode command
  end         End current mode and change to enable mode
  exit        Exit current mode and down to previous mode
  list        Print command list
  more        Display the contents of a file
  no          Negate a command or set its defaults
  ping        Send echo messages
  quit        Exit current mode and down to previous mode
  reboot      Reboot system
  reload      copy a default-config file to replace the current one
  show        Show running system information
```


Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Global Configuration Mode: Press **configure terminal** in privileged EXEC mode. You can then enter global configuration mode. In global configuration mode, you can configure all the features that the system provides you.

Type **interface IFNAME/VLAN** to enter interface configuration mode, **exit** to leave. **?** to see the command list.

Available command lists of global configuration mode.

```
Switch# configure terminal
Switch(config)#
  access-list          Add an access list entry
  administrator        Administrator account setting
  arp                  Set a static ARP entry
  clock                Configure time-of-day clock
  default              Set a command to its defaults
  end                  End current mode and change to enable mode
  exit                 Exit current mode and down to previous mode
  gvrp                 GARP VLAN Registration Protocol
  hostname             Set system's network name
  interface            Select an interface to configure
  ip                       IP information
  lacp                 Link Aggregation Control Protocol
  list                 Print command list
  log                  Logging control
  mac                  Global MAC configuration subcommands
  mac-address-table    mac address table
  mirror               Port mirroring
  no                       Negate a command or set its defaults
  ntp                  Configure NTP
  password             Assign the terminal connection password
  qos                  Quality of Service (QoS)
  relay                relay output type information
  smtp-server          SMTP server configuration
  snmp-server          SNMP server
  spanning-tree        spanning tree algorithm
  super-ring           super-ring protocol
  trunk                Trunk group configuration
  vlan                 Virtual LAN
  warning-event        Warning event selection
  write-config         Specify config files to write to
```

(Port) Interface Configuration: Press **interface IFNAME** in global configuration mode. You can then enter interface configuration mode. In this mode, you can configure port settings.

The port interface name for fast Ethernet port 1 is fa1,… fast Ethernet 7 is fa7, gigabit Ethernet port 8 is gi8.. gigabit Ethernet port 10 is gi10. Type interface name accordingly when you want to enter certain interface configuration mode.

Type **exit** to leave.

Type **?** to see the command list

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Available command lists of the global configuration mode.

```
Switch(config)# interface fa1
Switch(config-if)#
  acceptable           Configure 802.1Q acceptable frame types of a port.
  auto-negotiation     Enable auto-negotiation state of a given port
  description          Interface specific description
  duplex               Specify duplex mode of operation for a port
  end                  End current mode and change to enable mode
  exit                 Exit current mode and down to previous mode
  flowcontrol          Set flow-control value for an interface
  garp                 General Attribute Registration Protocol
  ingress                   802.1Q ingress filtering features
  lacp                 Link Aggregation Control Protocol
  list                 Print command list
  loopback             Specify loopback mode of operation for a port
  mac                  MAC interface commands
  mdix                 Enable mdix state of a given port
  no                   Negate a command or set its defaults
  qos                  Quality of Service (QoS)
  quit                 Exit current mode and down to previous mode
  rate-limit           Rate limit configuration
  shutdown             Shutdown the selected interface
  spanning-tree        spanning-tree protocol
  speed                Specify the speed of a Fast Ethernet port or a
Gigabit Ethernet port.
  switchport           Set switching mode characteristics
```

(VLAN) Interface Configuration: Press **interface VLAN VLAN-ID** in global configuration mode. You can then enter VLAN interface configuration mode. In this mode, you can configure the settings for the specific VLAN.

The VLAN interface name of VLAN 1 is VLAN 1, VLAN 2 is VLAN 2…

Type **exit** to leave the mode. Type **?** to see the available command list.

The command lists of the VLAN interface configuration mode.

```
Switch(config)# interface vlan 1
Switch(config-if)#
  description     Interface specific description
  end             End current mode and change to enable mode
  exit            Exit current mode and down to previous mode
  ip              Interface Internet Protocol config commands
  list            Print command list
  no              Negate a command or set its defaults
  quit            Exit current mode and down to previous mode
  shutdown        Shutdown the selected interface
```


Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Summary of the 5 command modes.

Command Mode	**Main Function**	**Enter and Exit Method**	**Prompt**
User EXEC	This is the first level of access. User can ping, telnet remote device, and show some basic information	Enter: **Login** successfully Exit: **exit** to logout. Next mode: Type **enable** to enter privileged EXEC mode.	Switch>
Privileged EXEC	In this mode, the system allows you to view current configuration, reset default, reload switch, show system information, save configuration…and enter global configuration mode.	Enter: Type **enable** in User EXEC mode. Exec: Type **disable** to exit to user EXEC mode. Type **exit** to logout Next Mode: Type **configure terminal** to enter global configuration command.	Switch#
Global configuration	In global configuration mode, you can configure all the features that the system provides you	Enter: Type **configure terminal** in privileged EXEC mode Exit: Type **exit** or **end** or press **Ctrl-Z** to exit. Next mode: Type **interface IFNAME/ VLAN VID** to enter interface configuration mode	Switch(config)#
Port Interface configuration	In this mode, you can configure port related settings.	Enter: Type **interface IFNAME** in global configuration mode. Exit: Type **exit** or **Ctrl+Z** to global configuration mode. Type **end** to privileged EXEC mode.	Switch(config-if)#
VLAN Interface Configuration	In this mode, you can configure settings for specific VLAN.	Enter: Type **interface VLAN VID** in global configuration mode. Exit: Type **exit** or **Ctrl+Z** to global configuration mode. Type **end** to privileged EXEC mode.	Switch(config-vlan)#

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Here are some useful commands for you to see these available commands. Save your time in typing and avoid typing error.

? To see all the available commands in this mode. It helps you to see the next command you can/should type as well.

```
Switch(config)# interface (?)
  IFNAME  Interface's name
  vlan     Select a vlan to configure
```

(Character)? To see all the available commands starts from this character.

```
Switch(config)# a?
  access-list     Add an access list entry
  administrator   Administrator account setting
  arp         Set a static ARP entry
```

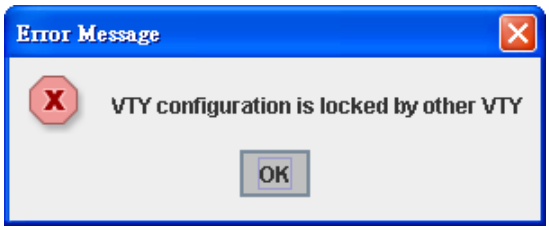
Tab This tab key helps you to input the command quicker. If there is only one available command in the next, clicking on tab key can help to finish typing soon.

```
Switch# co (tab) (tab)
Switch# configure terminal

Switch(config)# ac (tab)
Switch(config)# access-list
```

Ctrl+C To stop executing the unfinished command.
Ctrl+S To lock the screen of the terminal. You can't input any command.
Ctrl+Q To unlock the screen which is locked by Ctrl+S.
Ctrl+Z To exit configuration mode.

Alert message when multiple users want to configure the switch. If the administrator is in configuration mode, then the Web users can't change the settings. The switch allows only one administrator to configure the switch at a time.



Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.2 Basic Setting

The Basic Setting group provides you to configure switch information, IP address, User name/Password of the system. It also allows you to do firmware upgrade, backup and restore configuration, reload factory default, and reboot the system.

Following commands are included in this group:

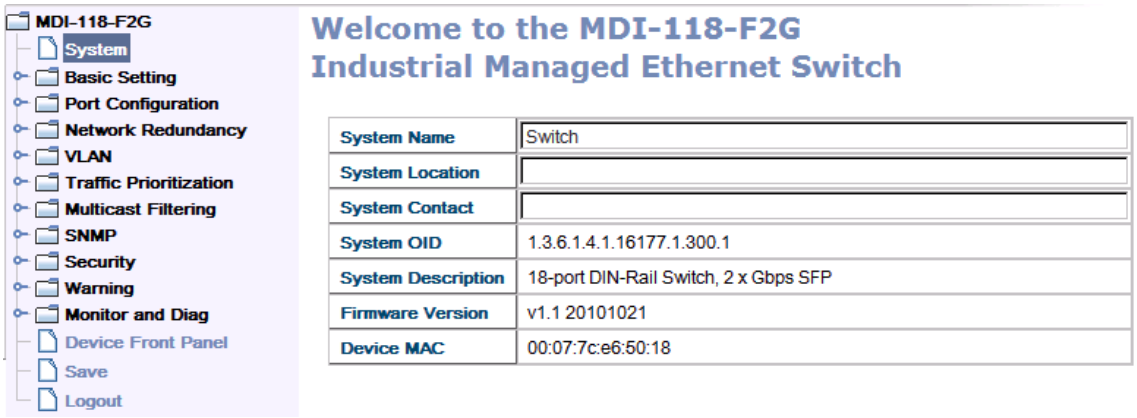
4.2.1 Switch Setting
4.2.2 Admin Password
4.2.3 IP Configuration
4.2.4 Time Setting
4.2.5 Jumbo Frame
4.2.6 DHCP Server
4.2.7 Backup and Restore
4.2.8 Firmware Upgrade
4.2.9 Factory Default
4.2.10 System Reboot
4.2.11 CLI Commands for Basic Setting

4.2.1 Switch Setting

You can assign System name, Location, Contact and view system information.

Figure 4.2.1.1 – Web UI of the Switch Setting

System Name: You can assign a name to the device. The number of characters you can input is 64. After you configure the name, CLI system will select the first 12 characters as the name in CLI system.



System Location: You can specify the switch's physical location here. The number of characters you can input are 64.

System Contact: You can specify contact people here. You can type the name,

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

mail address or other information of the administrator. The available characters you can input are 64.

System OID: The SNMP object ID of the switch. You can follow the path to find its private MIB in MIB browser.

Note: When you attempt to view private MIB, you should compile private MIB files into your MIB browser first.

System Description: The name of this switch.

Firmware Version: Display the firmware version installed in this device.

MAC Address: Display unique hardware address (MAC address) assigned by the manufacturer.

Once you finish the configuration, click on **Apply** to apply your settings.

Note: Always remember to select **Save** to save your settings. Otherwise, the settings you made will be lost when the switch is powered off.

4.2.2 Admin Password

You can change the user name and the password here to enhance security

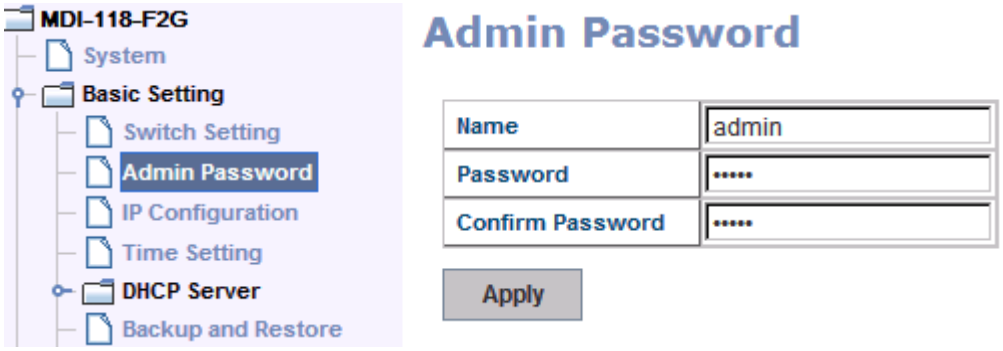


Figure 4.2.2.1 Web UI of the Admin Password

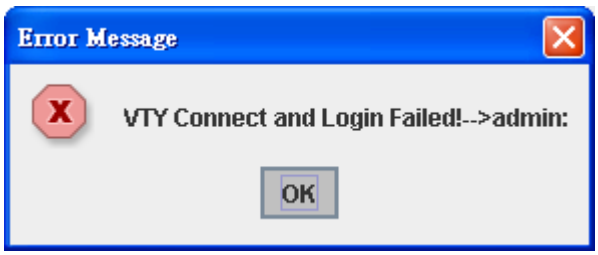
User name: You can key in new user name here. The default setting is **admin**.

Password: You can key in new password here. The default setting is **westermo**.

Confirm Password: You need to type the new password again to confirm it.

Once you finish configuring the settings, click on **Apply** to apply your configuration.

Figure 4.2.2.2 Popup alert window for Incorrect Username.



Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.2.3 IP Configuration

This function allows users to configure the switch's IP address settings.

DHCP Client: You can select to **Enable** or **Disable** DHCP Client function. When DHCP Client function is enabled, an IP address will be assigned to the switch from the network's DHCP server. In this mode, the default IP address will therefore be replaced by the one assigned by DHCP server. If DHCP Client is disabled, then the IP address that you specified will be used instead.

IP Address: You can assign the IP address reserved by your network for your switch. If DHCP Client function is enabled, you don't need to assign an IP address to the switch, as it will be overwritten by DHCP server and shown here. The default IP is 192.168.2.200.

Subnet Mask: You can assign the subnet mask for the IP address here. If DHCP Client function is enabled, you don't need to assign the subnet mask. The default Subnet Mask is 255.255.255.0.

Note: In the CLI, we use the enabled bit of the subnet mask to represent the number displayed in web UI. For example, 8 stands for 255.0.0.0; 16 stands for 255.255.0.0; 24 stands for 255.255.255.0.

Default Gateway: You can assign the gateway for the switch here. The default gateway is 192.168.2.254. **Note:** In CLI, we use 0.0.0.0/0 to represent for the default gateway.

Once you finish configuring the settings, click on **Apply** to apply your configuration.

4.2.4 Time Setting

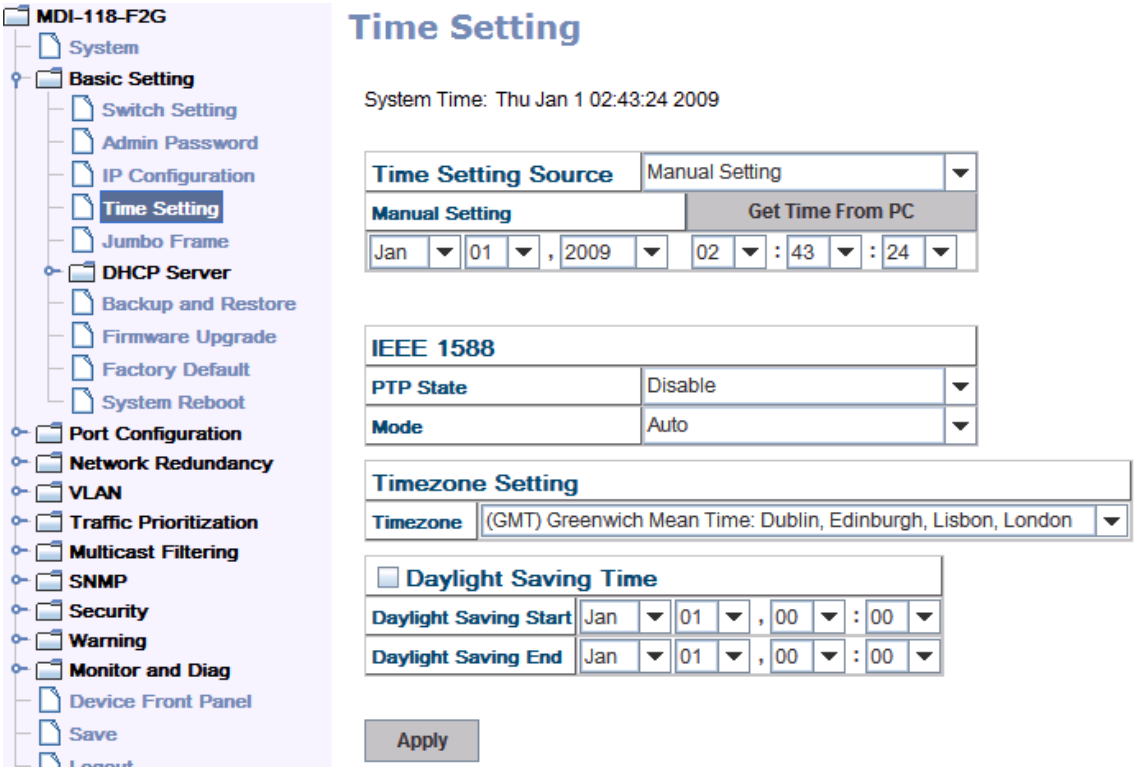
Time Setting source allow user to set the time manually or through NTP server. Network

Time Protocol (NTP) is used to synchronize computer clocks on the internet. You can configure NTP settings here to synchronize the clocks of several switches on

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

the network.

It also provides Daylight Saving function.



Manual Setting: User can select "**Manual setting**" to change time as user wants. User also can click the button "**Get Time from PC**" to get PC's time setting for switch.

NTP client: Select the Time Setting Source to NTP client can let device enable the NTP client service. NTP client will be automatically enabled if you change Time source to NTP Client. The system will send request packet to acquire current time from the NTP server you assigned.

IEEE 1588: With the **Precision Time Protocol IEEE 1588** there is now, for the first time, a standard available which makes it possible to synchronize the clocks of different end devices over a network at speeds faster than one microsecond.

To enable IEEE 1588, select Enable in PTP Status and choose Auto, Master or Slave Mode. After time synchronized, the system time will display the correct time of the PTP server.

Time-zone: Select the time zone where the switch is located. Following table lists the time zones for different locations for your reference. The default time zone is GMT Greenwich Mean Time.

Switch(config)# clock timezone

01 (GMT-12:00) Eniwetok, Kwajalein

02 (GMT-11:00) Midway Island, Samoa

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

03 (GMT-10:00) Hawaii
04 (GMT-09:00) Alaska
05 (GMT-08:00) Pacific Time (US & Canada) , Tijuana
06 (GMT-07:00) Arizona
07 (GMT-07:00) Mountain Time (US & Canada)
08 (GMT-06:00) Central America
09 (GMT-06:00) Central Time (US & Canada)
10 (GMT-06:00) Mexico City
11 (GMT-06:00) Saskatchewan
12 (GMT-05:00) Bogota, Lima, Quito
13 (GMT-05:00) Eastern Time (US & Canada)
14 (GMT-05:00) Indiana (East)
15 (GMT-04:00) Atlantic Time (Canada)
16 (GMT-04:00) Caracas, La Paz
17 (GMT-04:00) Santiago
18 (GMT-03:00) NewFoundland
19 (GMT-03:00) Brasilia
20 (GMT-03:00) Buenos Aires, Georgetown
21 (GMT-03:00) Greenland
22 (GMT-02:00) Mid-Atlantic
23 (GMT-01:00) Azores
24 (GMT-01:00) Cape Verde Is.
25 (GMT) Casablanca, Monrovia
26 (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London
27 (GMT+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna
28 (GMT+01:00) Belgrade, Bratislava, Budapest, Ljubljana, Prague
29 (GMT+01:00) Brussels, Copenhagen, Madrid, Paris
30 (GMT+01:00) Sarajevo, Skopje, Sofija, Vilnius, Warsaw, Zagreb
31 (GMT+01:00) West Central Africa
32 (GMT+02:00) Athens, Istanbul, Minsk
33 (GMT+02:00) Bucharest
34 (GMT+02:00) Cairo
35 (GMT+02:00) Harare, Pretoria
36 (GMT+02:00) Helsinki, Riga, Tallinn
37 (GMT+02:00) Jerusalem
38 (GMT+03:00) Baghdad
39 (GMT+03:00) Kuwait, Riyadh
40 (GMT+03:00) Moscow, St. Petersburg, Volgograd

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

41 (GMT+03:00) Nairobi
42 (GMT+03:30) Tehran
43 (GMT+04:00) Abu Dhabi, Muscat
44 (GMT+04:00) Baku, Tbilisi, Yerevan
45 (GMT+04:30) Kabul
46 (GMT+05:00) Ekaterinburg
47 (GMT+05:00) Islamabad, Karachi, Tashkent
48 (GMT+05:30) Calcutta, Chennai, Mumbai, New Delhi
49 (GMT+05:45) Kathmandu
50 (GMT+06:00) Almaty, Novosibirsk
51 (GMT+06:00) Astana, Dhaka
52 (GMT+06:00) Sri Jayawardenepura
53 (GMT+06:30) Rangoon
54 (GMT+07:00) Bangkok, Hanoi, Jakarta
55 (GMT+07:00) Krasnoyarsk
56 (GMT+08:00) Beijing, Chongqing, Hong Kong, Urumqi
57 (GMT+08:00) Irkutsk, Ulaan Bataar
58 (GMT+08:00) Kuala Lumpur, Singapore
59 (GMT+08:00) Perth
60 (GMT+08:00) Taipei
61 (GMT+09:00) Osaka, Sapporo, Tokyo
62 (GMT+09:00) Seoul
63 (GMT+09:00) Yakutsk
64 (GMT+09:30) Adelaide
65 (GMT+09:30) Darwin
66 (GMT+10:00) Brisbane
67 (GMT+10:00) Canberra, Melbourne, Sydney
68 (GMT+10:00) Guam, Port Moresby
69 (GMT+10:00) Hobart
70 (GMT+10:00) Vladivostok
71 (GMT+11:00) Magadan, Solomon Is., New Caledonia
72 (GMT+12:00) Aukland, Wellington
73 (GMT+12:00) Fiji, Kamchatka, Marshall Is.
74 (GMT+13:00) Nuku'alofa

Daylight Saving Time: Set when Enable Daylight Saving Time start and end, during the
Daylight Saving Time, the device’s time is one hour earlier than the actual time.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

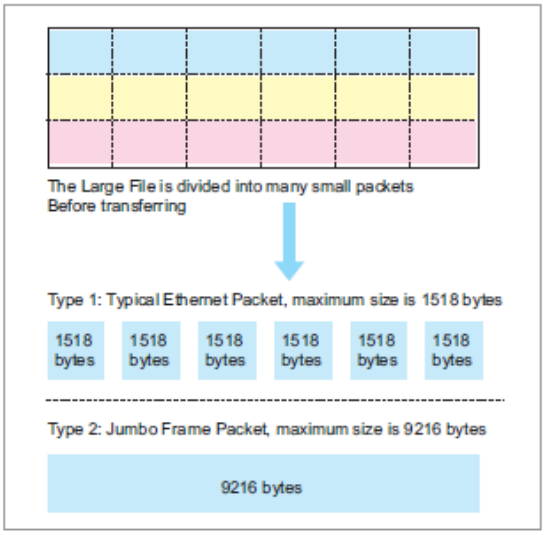
Once you finish your configuration, click on **Apply** to apply your configuration.

Daylight Saving Time: Set when Enable Daylight Saving Time start and end, during the Daylight Saving Time, the device's time is one hour earlier than the actual time.

Once you finish your configuration, click on **Apply** to apply your configuration.

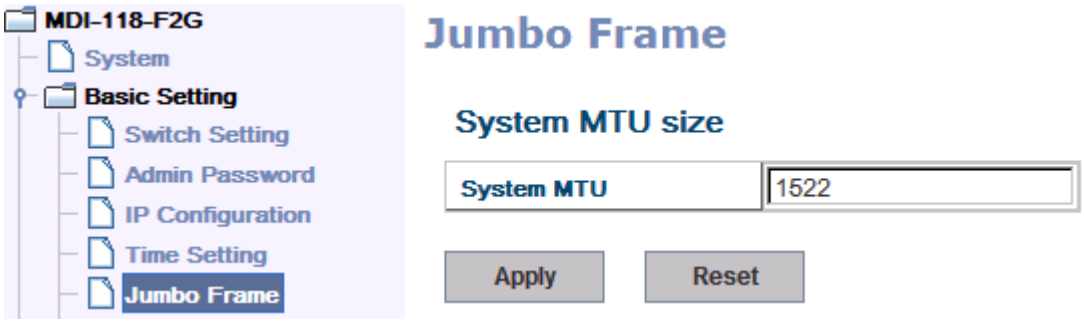
4.2.5 Jumbo Frame

What is Jumbo Frame?


The Large File is divided into many small packets
Before transferring
Type 1: Typical Ethernet Packet, maximum size is 1518 bytes
1518 bytes
1518 bytes
1518 bytes
1518 bytes
1518 bytes
1518 bytes
Type 2: Jumbo Frame Packet, maximum size is 9216 bytes
9216 bytes

A typical Ethernet frame is range from 64 to 1518 bytes. This is sufficient for general usages. However, when users want to transmit large files, the files may be divided into many small size packets. While the transmitting speed becomes slow, long size Jumbo frame can solve the issue.

The switch allows you configure the size of the MTU, Maximum Transmission Unit. The default value is 1,518bytes. The maximum Jumbo Frame size is 9,216 bytes. You can freely change the available packet size.



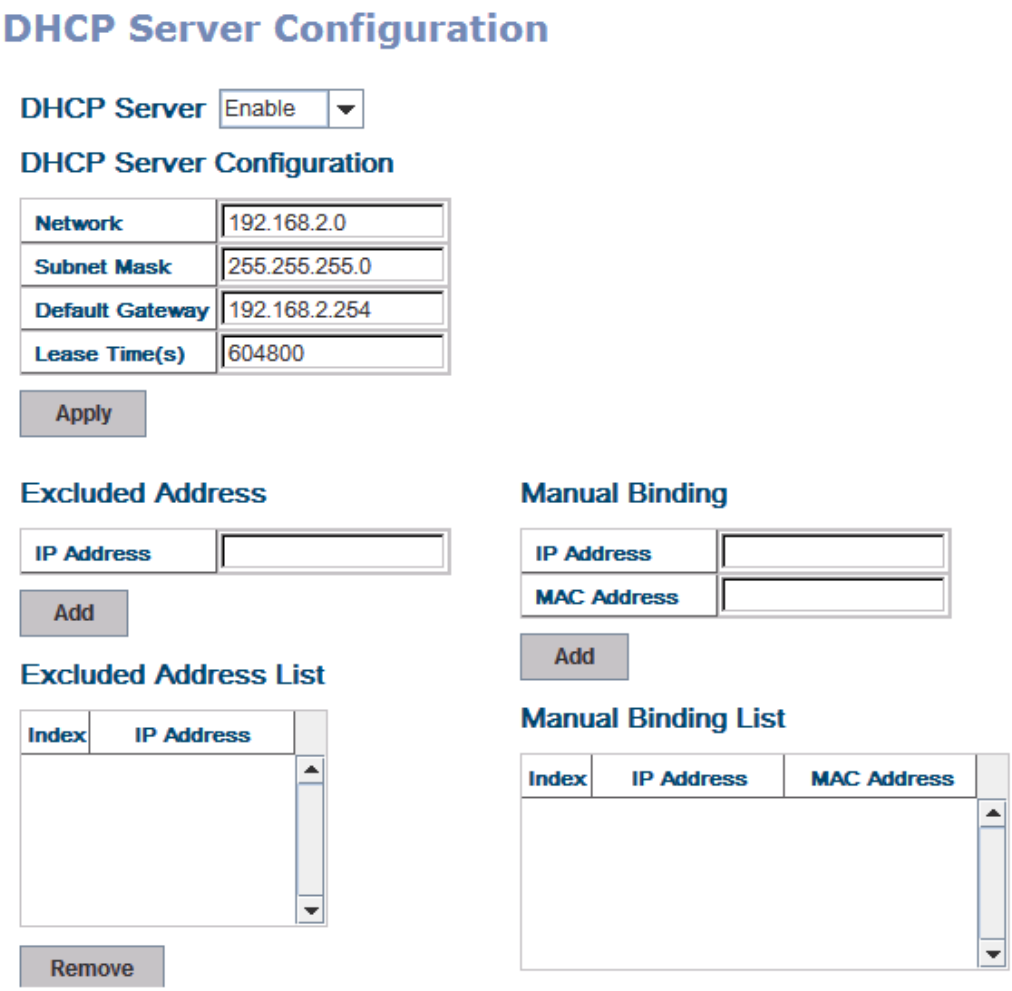
Once you finish your configuration, click on **Apply** to apply your configuration.

4.2.6 DHCP Server

You can select to **Enable** or **Disable** DHCP Server function. It will assign a new IP address to link partners.

DHCP Server configuration

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



After selecting to enable DHCP Server function, type in the Network IP address for the DHCP server IP pool, Subnet Mask, Default Gateway address and Lease Time for client.

Once you have finished the configuration, click **Apply** to apply your configuration

Excluded Address:

You can type a specific address into the **IP Address field** for the DHCP server reserved IP address.

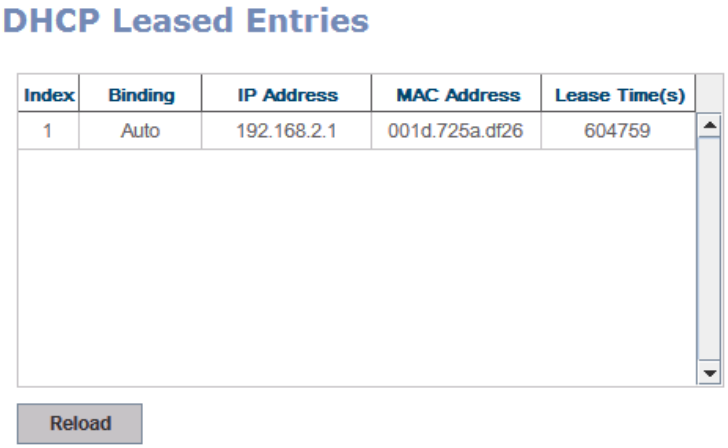
The IP address that is listed in the **Excluded Address List Table** will not be assigned to the network device. Add or remove an IP address from the **Excluded Address List** by clicking **Add** or **Remove**.

Manual Binding: the switch provides a MAC address and IP address binding and removing function. You can type in the specified IP and MAC address, then click **Add** to add a new MAC&IP address binding rule for a specified link partner, like PLC or any device without **DHCP client** function. To remove from the binding list, just select the rule to remove and click **Remove**.

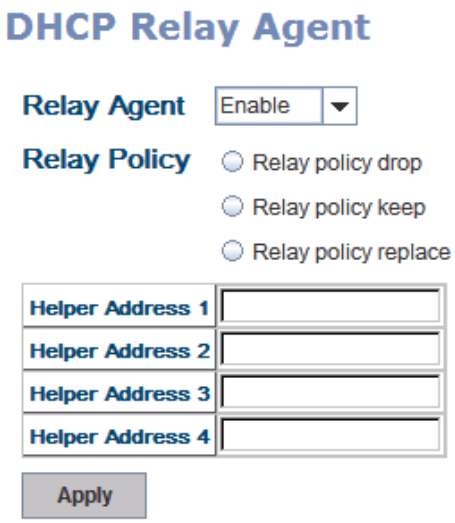
DHCP Leased Entries: the switch provides an assigned IP address list for user check. It will show the MAC and IP address that was assigned by the switch. Click

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

the **Reload** button to refresh the listing.



DHCP Relay Agent



You can select to **Enable** or **Disable** DHCP relay agent function, and then select the modification type of option 82 field.

Relay policy drop: Drops the option 82 field and do not add any option 82 field.

Relay policy keep: Keeps the original option 82 field and forwards to server.

Relay policy replace: Replaces the existing option 82 field and adds new option 82 field. (This is the default setting)

Helper Address: there are 4 fields for the DHCP server's IP address. You can filll the field with prefered IP address of DHCP Server, and then click "Apply" to activate the DHCP relay agent function. All the DHCP packets from client will be modified by the policy and forwarded to DHCP server through the gateway port.

4.2.7 Backup and Restore

With Backup command, you can save current configuration file saved in the switch's flash to admin PC or TFTP server. This will allow you to go to **Restore** command later to restore the configuration file back to the switch. Before you restore the configuration file, you must place the backup configuration file in the PC or TFTP server. The switch will then download this file back to the flash.

There are 2 modes for users to backup/restore the configuration file, Local File mode and TFTP Server mode.

Local File mode: In this mode, the switch acts as the file server. Users can browse the target folder and then type the file name to backup the configuration. Users

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

can also browse the target folder and select existed configuration file to restore the configuration back to the switch. This mode is only provided by Web UI while CLI is not supported.

TFTP Server mode: In this mode, the switch acts as TFTP client. Before you do so, make sure that your TFTP server is ready. Then please type the IP address of TFTP Server and Backup configuration file name. This mode can be used in both CLI and Web UI.

TFTP Server IP Address: You need to key in the IP address of your TFTP Server here.

Backup/Restore File Name: Please type the correct file name of the configuration file.

Configuration File: The configuration file of the switch is a pure text file. You can open it by word/txt read file. You can also modify the file, add/remove the configuration settings, and then restore back to the switch.

Startup Configuration File: After you saved the running-config to flash, the new settings will be kept and work after power cycle. You can use show startup-config to view it in CLI. The Backup command can only backup such configuration file to your PC or TFTP server.

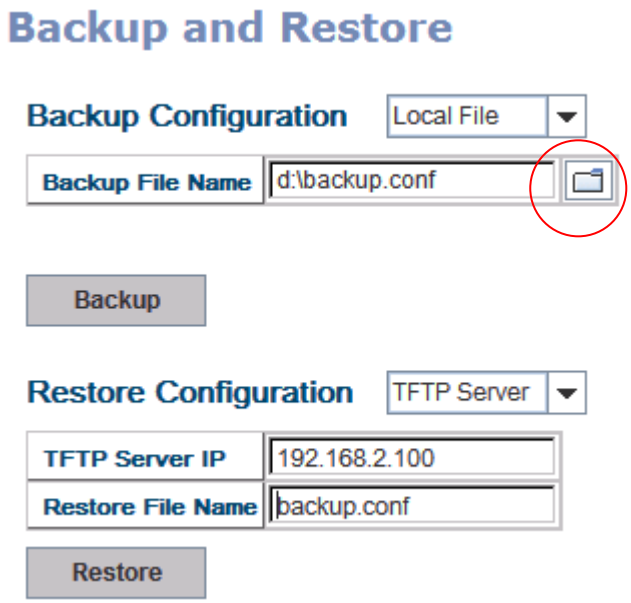
Technical Tip:

Default Configuration File: The switch provides the default configuration file in the system. You can use Reset button, Reload command to reset the system.

Running Configuration File: The CLI can show you the latest settings that are running on the system. The information shown here are the settings you set up but haven't saved to flash. The settings not yet saved to flash will not work after power recycle. You can use show running-config to view it in CLI.

Once you finish selecting and configuring the settings, click on **Backup** or **Restore** to run

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



Click on Folder icon to select the target file you want to backup/restore.

Note that the folders of the path to the target file do not allow you to input space key.

Type the IP address of TFTP Server IP. Then click on **Backup/Restore**.

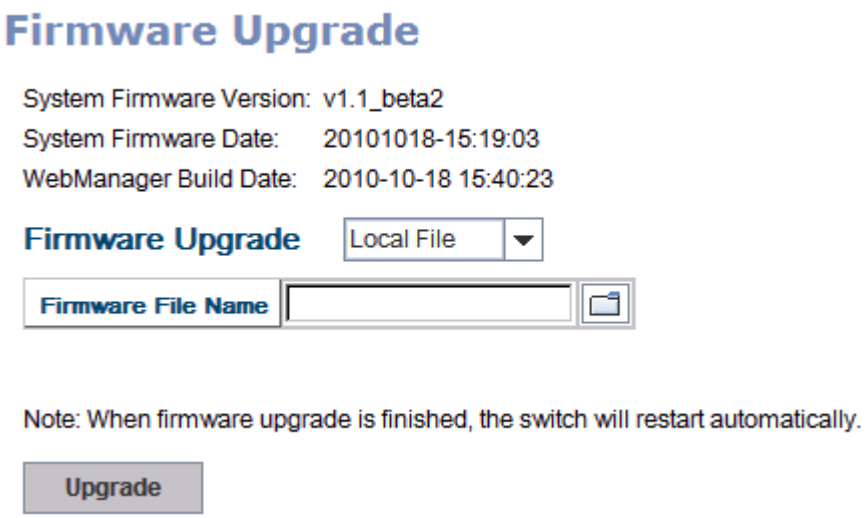
Note: point to the wrong file will cause the entire configuration missed.

4.2.8 Firmware Upgrade

In this section, you can update the latest firmware for your switch. Westermo provides the latest firmware in the web site. The new firmware may include new features, bug fixes or other software changes. We'll also provide the release notes for the update as well. For technical viewpoint, we suggest you use the latest firmware before installing the switch to the customer site.

Note that the system will be automatically rebooted after you finished upgrading new firmware. Please remind the attached users before you do this.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



There are 2 modes for users to backup/restore the configuration file, Local File mode and TFTP Server mode.

Local File mode: In this mode, the switch acts as the file server. Users can browse the target folder and then type the file name to backup the configuration. Users also can browse the target folder and select the existed configuration file to restore the configuration back to the switch. This mode is only provided by Web UI while CLI is not supported.

TFTP Server mode: In this mode, the switch acts as the TFTP client. Before you do so, make sure that your TFTP server is ready. And then please type the IP address of TFTP Server IP address. This mode can be used in both CLI and Web UI.

TFTP Server IP Address: You need to key in the IP address of your TFTP Server here.

Firmware File Name: The file name of the new firmware.

The UI also shows you the current firmware version and built date of current firmware. Please check the version number after the switch is rebooted.

Click on **Upgrade** to start the process.

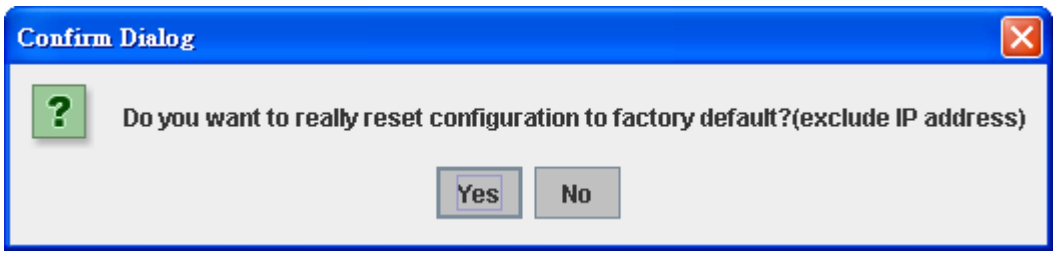
After finishing transmitting the firmware, the system will copy the firmware file and replace the firmware in the flash. The CLI show "……" until the process is finished.

4.2.9 Factory Default

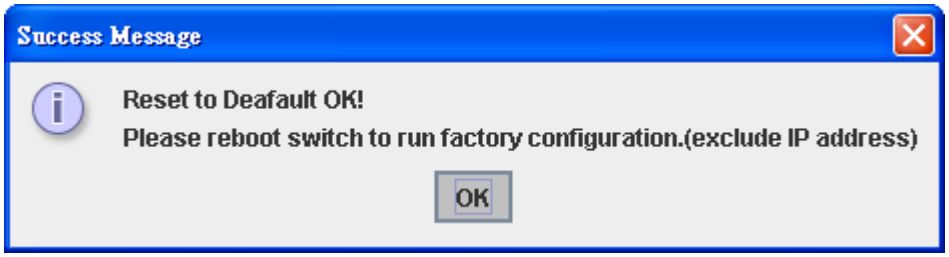
In this section, you can reset all the configurations of the switch to default setting. Click on **Reset** the system will then reset all configurations to default setting. The system will show you popup message window after finishing this command. Default setting will work after rebooting the switch.

Popup alert screen to confirm the command. Click on **Yes** to start it.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



Popup message screen to show you that have done the command. Click on **OK** to close the screen. Then please go to **Reboot** page to reboot the switch.



Click on **OK.** The system will then auto reboot the device.

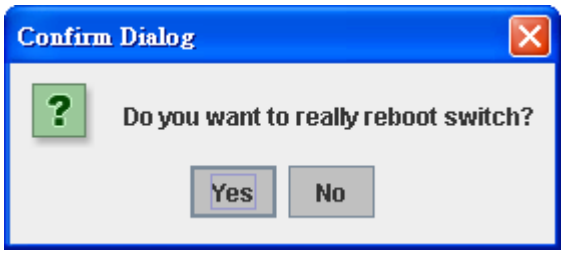
Note: If you already configured the IP of your device to other IP address, when you use this command by CLI and Web UI, our software will not reset the IP address to default IP. The system will remain the IP address so that you can still connect the switch via the network.

4.2.10 System Reboot

System Reboot allows you to reboot the device. Some of the feature changes require you to reboot the system. Click on **Reboot** to reboot your device.

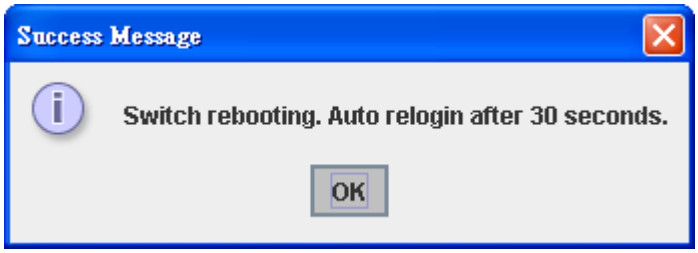
Note: Remember to click on **Save** button to save your settings. Otherwise, the settings you made will be gone when the switch is powered off.

Pop-up alert screen to request confirmation. Click on **Yes**. Then the switch will be rebooted immediately.



Pop-up message screen appears when rebooting the switch..

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



4.2.11 CLI Commands for Basic Setting

Feature	Command Line
Switch Setting	
System Name	Switch(config)# hostname WORD Network name of this system Switch(config)# hostname SWITCH SWITCH(config)#
System Location	SWITCH(config)# snmp-server location Sweden
System Contact	SWITCH(config)# snmp-server contact support@westermo.se
Display	SWITCH# show snmp-server name SWITCH SWITCH# show snmp-server location Sweden SWITCH# show snmp-server contact support@westermo.se SWITCH> show version 0.31-20061218 Switch# show hardware mac MAC Address : 00:07:7c:e6:00:00
Admin Password	

User Name and Password	SWITCH(config)# administrator
	  NAME Administrator account name
	SWITCH(config)# administrator orwell
	  PASSWORD Administrator account password
	SWITCH(config)# administrator orwell orwell
	Change administrator account orwell and password orwell success.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Display	SWITCH# show administrator Administrator account information name: orwell password: orwell
IP Configuration	
IP Address/Mask (192.168.2.8, 255.255.255.0	SWITCH(config)# int vlan 1 SWITCH(config-if)# ip address dhcp SWITCH(config-if)# ip address 192.168.2.8/24 SWITCH(config-if)# ip dhcp client SWITCH(config-if)# ip dhcp client renew
Gateway	SWITCH(config)# ip route 0.0.0.0/0 192.168.2.254/24
Remove Gateway	SWITCH(config)# no ip route 0.0.0.0/0 192.168.2.254/24
Display	SWITCH# show running-config …… ! interface vlan1 ip address 192.168.2.8/24 no shutdown ! ip route 0.0.0.0/0 192.168.2.254/24 !
Time Setting	
NTP Server	SWITCH(config)# ntp peer enable disable primary secondary SWITCH(config)# ntp peer primary IPADDR SWITCH(config)# ntp peer primary 192.168.2.200
Time Zone	SWITCH(config)# clock timezone 26 Sun Jan 1 04:13:24 2006 (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London Note: By typing clock timezone ?, you can see the timezone list. Then choose the number of the timezone you want to

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	select.
IEEE 1588	Switch(config)# ptpd run <cr> preferred-clock Preferred Clock slave Run as slave
Display	SWITCH# sh ntp associations Network time protocol Status : Disabled Primary peer : N/A Secondary peer : N/A SWITCH# show clock Sun Jan 1 04:14:19 2006 (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London SWITCH# show clock timezone clock timezone (26) (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London Switch# show ptpd PTPd is enabled Mode: Slave
Jumbo Frame	
Jumbo Frame	Switch(config)# system mtu jumbo <1500-9216> Switch(config)# system mtu jumbo 9000
DHCP Server	
DHCP Server configuration	Enable DHCP Server on Switch Switch# Switch# configure terminal Switch(config)# router dhcp Switch(config-dhcp)# service dhcp Configure DHCP network address pool Switch(config-dhcp)#network 192.168.17.0/24 -(network/mask)

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	Switch(config-dhcp)#default-router 192.168.17.254
Lease time configure	Switch(config-dhcp)#lease 300 (300 sec)
DHCP Relay Agent	Enable DHCP Relay Agent Switch# Switch# configure terminal Switch(config)# router dhcp Switch(config-dhcp)# service dhcp Switch(config-dhcp)# ip dhcp relay information option Enable DHCP Relay policy Switch(config-dhcp)# ip dhcp relay information policy replace drop Relay Policy keep Drop/Keep/Replace option82 field replace
Show DHCP server information	Switch# show ip dhcp server statistics Switch# show ip dhcp server statistics DHCP Server ON Address Pool 1 network:192.168.17.0/24 default-router:192.168.17.254 lease time:300 Excluded Address List IP Address ---------- (list excluded address) Manual Binding List IP Address MAC Address ---------- ---------- (list IP & MAC binding entry) Leased Address List IP Address MAC Address Leased Time Remains ---------- ---------- ---------- (list leased Time remain information for each entry)
Backup and Restore	
Backup Startup Configuration file	Switch# copy startup-config tftp: 192.168.2.33/default.conf Writing Configuration [OK]

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	Note 1: To backup the latest startup configuration file, you should save current settings to flash first. You can refer to 4.12 to see how to save settings to the flash. Note 2: 192.168.2.33 is the TFTP server's IP and default.conf is name of the configuration file. Your environment may use different IP addresses or different file name. Please type target TFTP server IP or file name in this command.
Restore Configuration	Switch# copy tftp: 192.168.2.33/default.conf startup-config
Show Startup Configuration	Switch# show startup-config
Show Running Configuration	Switch# show running-config
Firmware Upgrade	
Firmware Upgrade	Switch# archive download-sw /overwrite tftp 192.168.2.33 mdi-118.bin Firmware upgrading, mdi-118.bin Firmware upgrading .... Firmware upgrade success!! Rebooting.....
Factory Default	
Factory Default	Switch# reload default-config file Reload OK! Switch# reboot
System Reboot	
Reboot	Switch# reboot

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.3 Port Configuration

Port Configuration group enables you to enable/disable port state, or configure port auto-negotiation, speed, and duplex, flow control, rate limit control and port aggregation settings. It also allows you to view port status and aggregation information.

Following commands are included in this group:

4.3.1 Port Control

4.3.2 Port Status

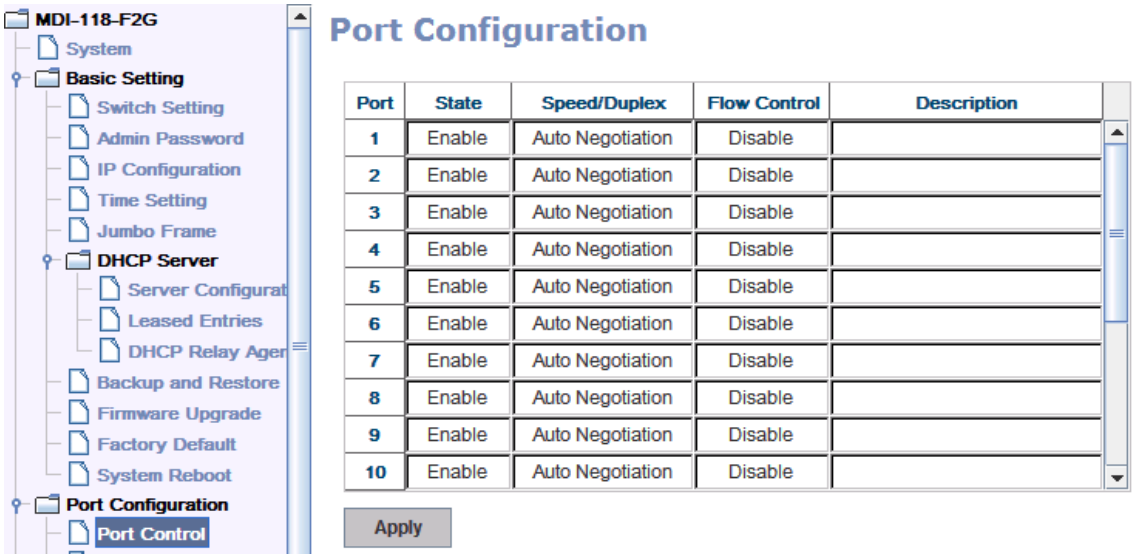
4.3.3 Rate Control

4.3.4 Port Trunking

4.3.5 Command Lines for Port Configuration

4.3.1 Port Control

Port Control commands allow you to enable/disable port state, or configure the port auto-negotiation, speed, duplex and flow control.



Select the port you want to configure and make changes to the port.

In **State** column, you can enable or disable the state of this port. Once you disable, the port stop to link to the other end and stop to forward any traffic. The default setting is Enable which means all the ports are workable when you receive the device.

In **Speed/Duplex** column, you can configure port speed and duplex mode of this port. Below are the selections you can choose:

Fast Ethernet Port: AutoNegotiation, 10M Full Duplex(10 Full), 10M Half Duplex(10 Half), 100M Full Duplex(100 Full) and 100M Half Duplex(100 Half).

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Gigabit Ethernet Port: AutoNegotiation, 10M Full Duplex(10 Full), 10M Half Duplex(10 Half), 100M Full Duplex(100 Full), 100M Half Duplex(100 Half), 1000M Full Duplex(1000 Full), 1000M Half Duplex(1000 Half).

The default mode is Auto Negotiation mode.

In **Flow Control** column, "Symmetric" means that you need to activate the flow control function of the remote network device in order to let the flow control of that corresponding port on the switch to work. "Disable" means that you don't need to activate the flow control function of the remote network device, as the flow control of that corresponding port on the switch will work anyway.

Once you finish configuring the settings, click on **Apply** to save the configuration.

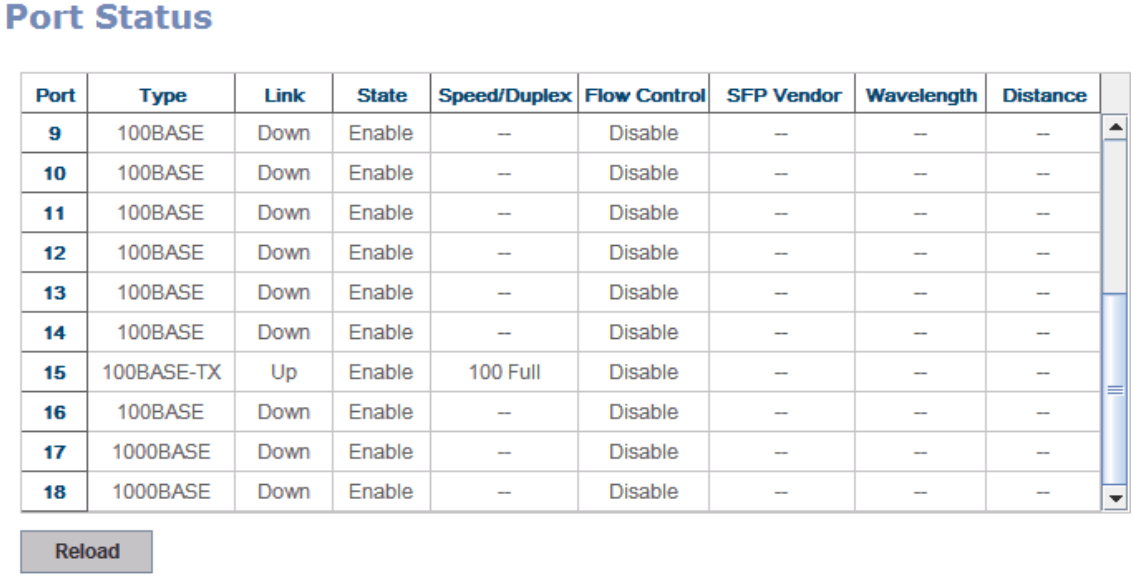
Technical Tips: If both ends are not at the same speed, they can't link with each other. If both ends are not in the same duplex mode, they will be connected by half mode.

4.3.2 Port Status

Port Status shows you current port status.

The switch supports SFP fiber transceiver with Digital Diagnostic Monitoring (DDM) function that provides real time information of SFP transceiver and allows user to diagnostic the optical fiber signal received and launched.

The information of SFP DDM will listing on another table.


Port Status
Port Type Link State Speed/Duplex Flow Control SFP Vendor Wavelength Distance
9 100BASE Down Enable -- Disable -- -- --
10 100BASE Down Enable -- Disable -- -- --
11 100BASE Down Enable -- Disable -- -- --
12 100BASE Down Enable -- Disable -- -- --
13 100BASE Down Enable -- Disable -- -- --
14 100BASE Down Enable -- Disable -- -- --
15 100BASE-TX Up Enable 100 Full Disable -- -- --
16 100BASE Down Enable -- Disable -- -- --
17 1000BASE Down Enable -- Disable -- -- --
18 1000BASE Down Enable -- Disable -- -- --
Reload

The description of the columns is as below:

Port: Port interface number.

Type: 100TX -> Fast Ethernet port. 1000TX -> Gigabit Ethernet port.

Link: Link status. Up -> Link UP. Down -> Link Down.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

State: Enable -> State is enabled. Disable -> The port is disable/shutdown.

Speed/Duplex: Current working status of the port.

Flow Control: The state of the flow control.

SFP Vendor: Vendor name of the SFP transceiver you plugged.

Wavelength: The wave length of the SFP transceiver you plugged.

Distance: The distance of the SFP transceiver you plugged.

Eject: Eject the DDM SFP transceiver. You can eject one port or eject all by click the icon "Eject All".

Temperature: The temperature spcific and current detected of DDM SFP transceiver.

Tx Power (dBm): The specification and current transmit power of DDM SFP transceiver.

Rx Power (dBm): The specification and current received power of DDM SFP transceiver.

Note: 1. Most of the SFP transceivers provide vendor information which allows your switch to read it. The UI can display vendor name, wave length and distance of all Westermo SFP transceiver family. If you see Unknown info, it may mean that the vendor doesn't provide their information or that the information of their transceiver can't be read.

2. if the plugged DDM SFP transceiver is not certified by Westermo, the DDM function will not be supported. But the communication will not be disabled.

4.3.3 Rate Control

Rate limiting is a form of flow control used to enforce a strict bandwidth limit at a port. You can program separate transmit (Egress Rule) and receive (Ingress Rule) rate limits at each port, and even apply the limit to certain packet types as described below.

The figure below shows you the Limit Rate of Ingress and Egress. You can type the volume in the blank. The volume of the switch is step by 8Kbps.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Rate Control

Limit Packet Type and Rate

Port	Ingress Rate(Kbps)	Egress Rate(Kbps)
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0

Apply

4.3.4 Storm Control

The Storm Control is similar to Rate Control. Rate Control filters all the traffic over the threshold you input by UI. Storm Control allows user to define the Rate for specific Packet Types.

Storm Control

Rate Configuration

Broadcast Rate(Kbytes/sec)	2000
DLF Rate(Kbytes/sec)	2000
Multicast Rate(Kbytes/sec)	2000

Port Configuration

Port	Broadcast	DLF	Multicast
1	Disable	Disable	Disable
2	Disable	Disable	Disable
3	Disable	Disable	Disable
4	Disable	Disable	Disable
5	Disable	Disable	Disable
6	Disable	Disable	Disable
7	Disable	Disable	Disable
8	Disable	Disable	Disable
9	Disable	Disable	Disable
10	Disable	Disable	Disable

Apply

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Packet type: You can assign the Rate for specific packet types based on packet number per second. The packet types of the Ingress Rule listed here include **Broadcast, DLF (Destination Lookup Failure) and Multicast**. Choose **Enable/Disable** to enable or disable the storm control of specific port.

Rate: This column allows you to manually assign the limit rate of the port. The unit is packets per second. The limit range is from 1 to 262143 packets/sec, zero means no limit. The maximum available value of Fast Ethernet interface is 148810, this is the maximum packet number of the 100M throughput.

Enter the Rate field of the port you want assign, type the new value and click Enter key first. After assigned or changed the value for all the ports you want configure. Click on **Apply** to apply the configuration of all ports. The Apply command applied all the ports' storm control value, it may take some time and the web interface become slow, this is normal condition.

4.3.5 Port Trunking

Port Trunking configuration allows you to group multiple Ethernet ports in parallel to increase link bandwidth. The aggregated ports can be viewed as one physical port so that the bandwidth is higher than merely one single Ethernet port. The member ports of the same trunk group can balance the loading and backup for each other. Port Trunking feature is usually used when you need higher bandwidth for backbone network. This is an inexpensive way for you to transfer more data.

There are some different descriptions for the port trunking. Different manufacturers may use different descriptions for their products, like Link Aggregation Group (LAG), Link Aggregation Control Protocol, Ethernet Trunk, Ether Channel…etc. Most of the implementations now conform to IEEE standard, 802.3ad.

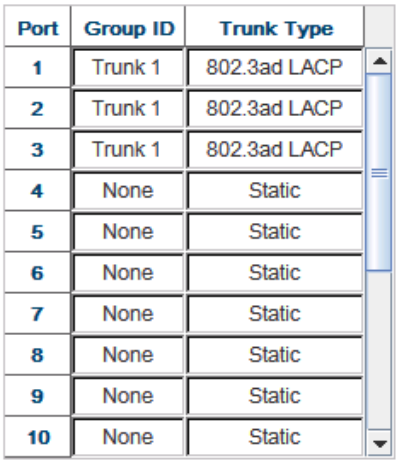
The aggregated ports can interconnect to the other switch which also supports Port Trunking. Supports 2 types of port trunking. One is Static Trunk, the other is 802.3ad. When the other end uses 802.3ad LACP, you **should** assign 802.3ad LACP to the trunk. When the other end uses non-802.3ad, you can then use Static Trunk. **In practical, the Static Trunk is suggested.**

There are 2 configuration pages, Aggregation Setting and Aggregation Status.

Aggregation Setting

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Port Trunk - Aggregation Setting



Port	Group ID	Trunk Type
1	Trunk 1	802.3ad LACP
2	Trunk 1	802.3ad LACP
3	Trunk 1	802.3ad LACP
4	None	Static
5	None	Static
6	None	Static
7	None	Static
8	None	Static
9	None	Static
10	None	Static

Note: The port parameters of the trunk members should be the same.

Apply

Trunk Size: The switch can support up to 8 trunk groups. Each trunk group can support up to 8 member ports. Since the member ports should use same speed/duplex, the maximum trunk size is decided by the port volume.

Group ID: Group ID is the ID for the port trunking group. Ports with same group ID are in the same group. Click None, you can select the Trunk ID from Trunk 1 to Trunk 8.

Trunk Type: Static and **802.3ad LACP.** Each Trunk Group can only support Static or 802.3ad LACP. Choose the type you need here. The not active port can't be setup here.

Aggregation Status

This page shows the status of port aggregation. Once the aggregation ports are negotiated well, you will see following status.

Port Trunk - Aggregation Information

Group ID	Type	Aggregated Ports	Individual Ports	Link Down Ports
Trunk 1	LACP	1,2		3
Trunk 2				
Trunk 3				
Trunk 4				
Trunk 5				
Trunk 6				
Trunk 7				
Trunk 8				

Group ID: Display Trunk id set up in Aggregation Setting.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Type: Static or LACP set up in Aggregation Setting.

Aggregated: When LACP links well, you can see the member ports in Aggregated column.

Individual: When LACP is enabled, member ports of LACP group which are not connected to correct LACP member ports will be displayed in the Individual column.

Link Down: When LACP is enabled, member ports of LACP group which are not linked up will be displayed in the Link Down column.

4.3.6 Command Lines for Port Configuration

Feature	Command Line
Port Control	
Port Control – State	Switch(config-if)# shutdown -> Disable port state Port1 Link Change to DOWN interface fastethernet1 is shutdown now. Switch(config-if)# no shutdown -> Enable port state Port1 Link Change to DOWN Port1 Link Change to UP interface fastethernet1 is up now. Switch(config-if)# Port1 Link Change to UP Switch(config)# sfp ddm Digital diagnostic and monitoring Switch(config)# sfp ddm Eject Reject DDM SFP Switch(config)# sfp ddm eject → eject SFP DDM transceiver all All DDM interface Example: Switch(config)# sfp ddm eject all DDM SFP on Port 9 normally ejected. DDM SFP on Port 9 normally ejected. All DDM SFP normally ejected. Switch(config)# interface gigabitethernet10 → eject port 10 SFP DDM transceiver. Switch(config-if)# sfp ddm eject DDM SFP on Port 10 normally ejected.
Port Control –	Switch(config)# interface fa1

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Auto Negotiation	Switch(config-if)# auto-negotiation Auto-negotiation of port 1 is enabled!
Port Control – Force Speed/Duplex	Switch(config-if)# speed 100 Port1 Link Change to DOWN set the speed mode ok! Switch(config-if)# Port1 Link Change to UP Switch(config-if)# duplex full Port1 Link Change to DOWN set the duplex mode ok! Switch(config-if)# Port1 Link Change to UP
Port Control – Flow Control	Switch(config-if)# flowcontrol on Flowcontrol on for port 1 set ok! Switch(config-if)# flowcontrol off Flow control off for port 1 set ok!
Port Status	
Port Status	Switch# show interface fa1 Interface fastethernet1 Administrative Status : Enable Operating Status : Connected Duplex : Full Speed : 100 Flow Control :off Default Port VLAN ID: 1 Ingress Filtering : Disabled Acceptable Frame Type : All Port Security : Disabled Auto Negotiation : Disable Loopback Mode : None STP Status: forwarding Default CoS Value for untagged packets is 0. Mdix mode is Disable. Medium mode is Copper. Switch# show sfp ddm →show SFP DDM information Port 8

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	Temperature:N/A Tx power:N/A Rx power:N/A Port 9 Temperature:64.00 C <range :0.0-80.00> Tx power:-6.0 dBm <range : -9.0 - -4.0> Rx power:-30.0 dBm <range: -30.0 - -4.0> Port 10 Temperature:67.00 C <range :0.0-80.00> Tx power:-6.0 dBm <range : -9.0 - -4.0> Rx power:-2.0 dBm <range: -30.0 - -4.0> Note: Administrative Status -> Port state of the port. Operating status -> Current status of the port. Duplex -> Duplex mode of the port. Speed -> Speed mode of the port. Flow control -> Flow Control status of the port.
Rate Control	
Rate Control – Ingress or Egress	Switch(config-if)# rate-limit egress Outgoing packets ingress Incoming packets Note: To enable rate control, you should select the Ingress or Egress rule first; then assign the packet type and bandwidth.
Rate Control – Filter Packet Type	Switch(config-if)# rate-limit ingress mode all Limit all frames broadcast Limit Broadcast frames flooded-unicast Limit Broadcast, Multicast and flooded unicast frames multicast Limit Broadcast and Multicast frames Switch(config-if)# rate-limit ingress mode broadcast Set the ingress limit mode broadcast ok.
Rate Control - Bandwidth	Switch(config-if)# rate-limit ingress bandwidth <0-100> Limit in magabits per second (0 is no limit) Switch(config-if)# rate-limit ingress bandwidth 8 Set the ingress rate limit 8Mbps for Port 1.
Storm Control	
Strom	Switch(config-if)# storm-control

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Control – Packet Type	broadcast Broadcast packets dlf Destination Lookup Failure multicast Multicast packets
Storm Control - Rate	Switch(config-if)# storm-control broadcast <0-262143> Rate limit value 0~262143 packet/sec Switch(config-if)# storm-control broadcast 10000 Enables rate limit for Broadcast packets for Port 13. Switch(config-if)# storm-control multicast 10000 Enables rate limit for Multicast packets for Port 13. Switch(config-if)# storm-control dlf 10000 Enables rate limit for Destination Lookup Failue packets for Port 13.
Port Trunking	
LACP	Switch(config)# lacp group 1 gi8-10 Group 1 based on LACP(802.3ad) is enabled! Note: The interface list is fa1,fa3-5,gi8-10 Note: different speed port can't be aggregated together.
Static Trunk	Switch(config)# trunk group 2 fa6-7 Trunk group 2 enable ok!
Display - LACP	Switch# show lacp internal LACP group 1 internal information: LACP Port Admin Oper Port Port Priority Key Key State ----- ---------- -------- -------- ------- 8 1 8 8 0x45 9 1 9 9 0x45 10 1 10 10 0x45 LACP group 2 is inactive LACP group 3 is inactive LACP group 4 is inactive
Display - Trunk	Switch# show trunk group 1 FLAGS: I -> Individual P -> In channel D -> Port Down Trunk Group GroupID Protocol Ports

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	--------+---------+----------------------------------- 1 LACP 8(D) 9(D) 10(D) Switch# show trunk group 2 FLAGS: I -> Individual P -> In channel D -> Port Down Trunk Group GroupID Protocol Ports --------+---------+----------------------------------- 2 Static 6(D) 7(P) Switch#

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.4 Network Redundancy

It is critical for industrial applications that network remains non-stop. The switch firmware supports standard RSTP, Multiple Super Ring, Rapid Dual Homing.

Multiple Super Ring (MSR) technology ranks the fastest restore and failover time in the world, 0 ms for restore and about 5 milliseconds for failover for copper.

Advanced Rapid Dual Homing (RDH) technology also facilitates the switch to connect with a core managed switch easily and conveniently. With RDH technology, you can also couple several Rapid Super Rings or RSTP cloud together, which is also known as Auto Ring Coupling.

Besides ring technology, the switch also supports 802.1D-2004 version Rapid Spanning Tree Protocol (RSTP). New version of RSTP standard includes 802.1D-1998 STP, 802.1w RSTP.

Following commands are included in this group:

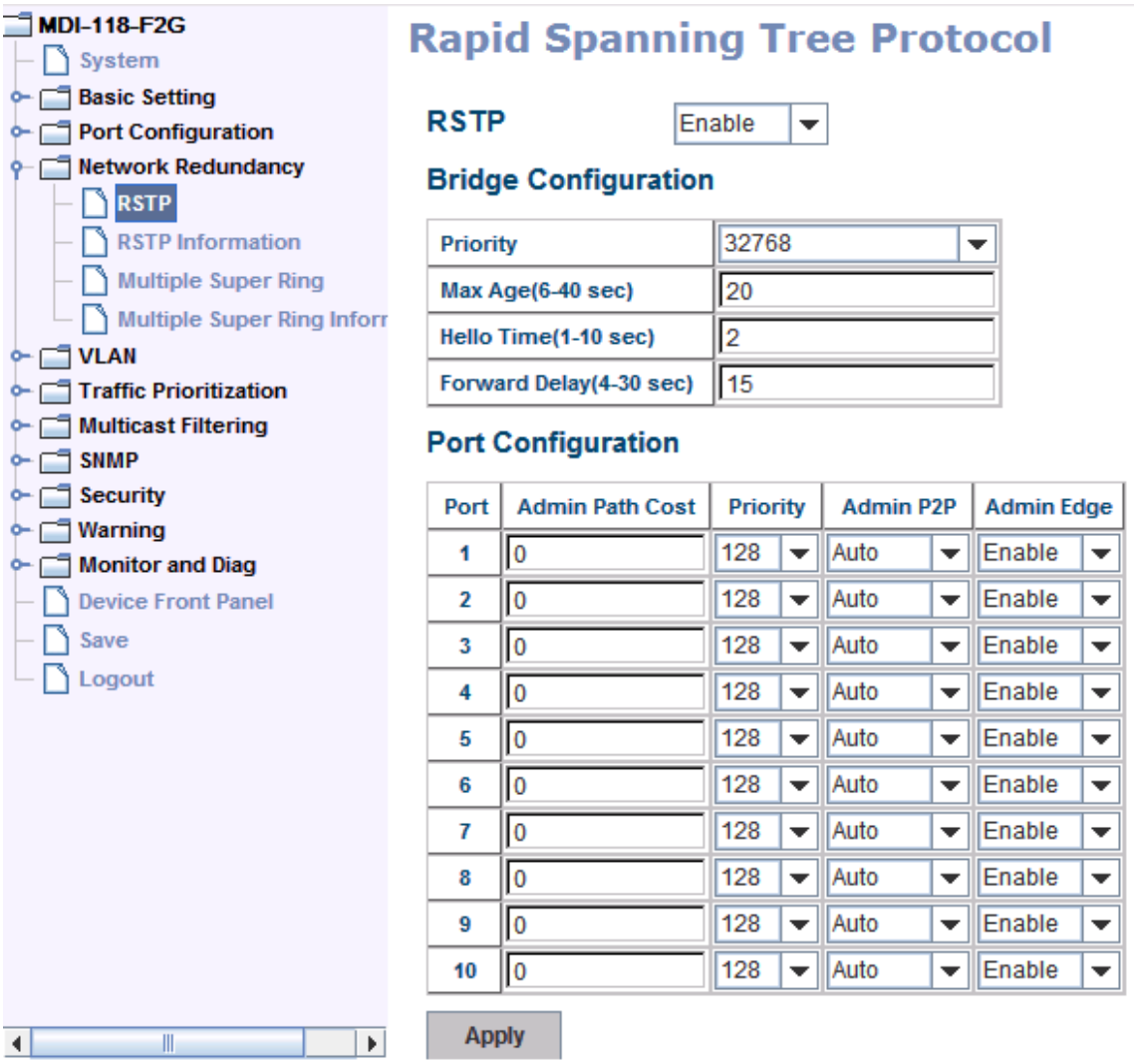
4.4.1 RSTP
4.4.2 RSTP Info
4.4.3 Multiple Super Ring
4.4.4 Ring Info
4.4.5 Command Lines for Network Redundancy

4.4.1 RSTP

RSTP is the abbreviation of Rapid Spanning Tree Protocol. If a switch has more than one path to a destination, it will lead to message loops that can generate broadcast storms and quickly bog down a network. The spanning tree was created to combat the negative effects of message loops in switched networks. A spanning tree uses a spanning tree algorithm (STA) to automatically sense whether a switch has more than one way to communicate with a node. It will then select the best path (primary), and block the other path(s). It will also keep track of the blocked path(s) in case the primary path fails. Spanning Tree Protocol (STP) introduced a standard method to accomplish this. It is specified in IEEE 802.1D-1998. Later, Rapid Spanning Tree Protocol (RSTP) was adopted and represents the evolution of STP, providing much faster spanning tree convergence after a topology change. This is specified in IEEE 802.1w. In 2004, 802.1w is included into 802.1D-2004 version. This switch supports both RSTP and STP (all switches that support RSTP are also backward compatible with switches that support only STP).

This page allows you to enable/disable RSTP, configure the global setting and port settings.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



RSTP Mode: You must first enable STP/RSTP mode, before configuring any related parameters. Parameter settings required for both STP and RSTP are the same. Note that 802.1d refers to STP mode, while 802.1w refers to faster RSTP mode.

Bridge Configuration

Priority (0-61440): RSTP uses bridge ID to determine the root bridge, the bridge with the highest bridge ID becomes the root bridge. The bridge ID is composed of bridge priority and bridge MAC address. So that the bridge with the highest priority becomes the highest bridge ID. If all the bridge ID has the same priority, the bridge with the lowest MAC address will then become the root bridge.

Note: The bridge priority value must be in multiples of 4096. A device with a lower number has a higher bridge priority. Ex: 4096 is higher than 32768.

Max Age (6-40): Enter a value from 6 to 40 seconds here. This value represents the time that a bridge will wait without receiving Spanning Tree Protocol configuration messages before attempting to reconfigure.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

If the switch is not the root bridge, and if it has not received a hello message from the root bridge in an amount of time equal to Max Age, then the switch will reconfigure itself as a root bridge. Once two or more devices on the network are recognized as a root bridge, the devices will renegotiate to set up a new spanning tree topology.

Hello Time (1-10): Enter a value from 1 to 10 seconds here. This is a periodic timer that drives the switch to send out BPDU (Bridge Protocol Data Unit) packet to check current STP status.

The root bridge of the spanning tree topology periodically sends out a "hello" message to other devices on the network to check if the topology is "healthy". The "hello time" is the amount of time the root has waited during sending hello messages.

Forward Delay Time (4-30): Enter a value between 4 and 30 seconds. This value is the time that a port waits before changing from Spanning Tree Protocol learning and listening states to forwarding state.

This is the amount of time the switch will wait before checking to see if it should be changed to a different state.

Once you have completed your configuration, click on **Apply** to apply your settings.

Note: You must observe the following rule to configure Hello Time, Forwarding Delay, and Max Age parameters.

2 × (Forward Delay Time – 1 sec) ≥ Max Age Time ≥ 2 × (Hello Time value + 1 sec)

Port Configuration

Select the port you want to configure and you will be able to view current settings and status of the port.

Path Cost: Enter a number between 1 and 200,000,000. This value represents the "cost" of the path to the other bridge from the transmitting bridge at the specified port.

Priority: Enter a value between 0 and 240, using multiples of 16. This is the value that decides which port should be blocked by priority in a LAN.

Admin P2P: Some of the rapid state transitions that are possible within RSTP depend upon whether the port of concern can only be connected to another bridge (i.e. it is served by a point-to-point LAN segment), or if it can be connected to two or more bridges (i.e. it is served by a shared-medium LAN segment). This function allows P2P status of the link to be manipulated administratively. "**Auto**"

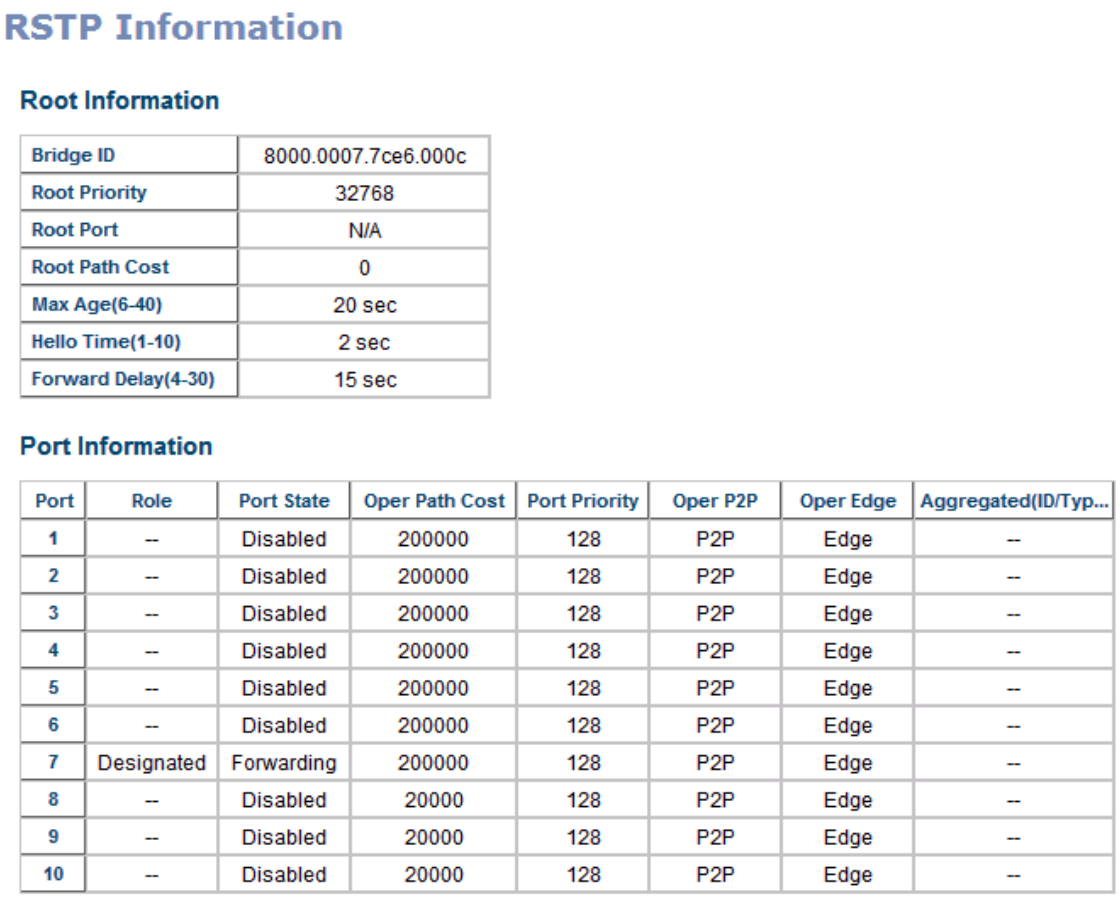
Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

means to auto select P2P or Share mode. "**P2P"** means P2P is enabled, while "**Share"** means P2P is disabled.

Admin Edge: A port directly connected to the end stations cannot create a bridging loop in the network. To configure this port as an edge port, set the port to the **Enable** state. When the non-bridge device connects an admin edge port, this port will be in blocking state and turn to forwarding state in 4 seconds.

Once you finish your configuration, click on **Apply** to save your settings.

4.4.2 RSTP Info



RSTP Information

Root Information

Bridge ID	8000.0007.7ce6.000c
Root Priority	32768
Root Port	N/A
Root Path Cost	0
Max Age(6-40)	20 sec
Hello Time(1-10)	2 sec
Forward Delay(4-30)	15 sec

Port Information

Port	Role	Port State	Oper Path Cost	Port Priority	Oper P2P	Oper Edge	Aggregated(ID/Typ...
1	--	Disabled	200000	128	P2P	Edge	--
2	--	Disabled	200000	128	P2P	Edge	--
3	--	Disabled	200000	128	P2P	Edge	--
4	--	Disabled	200000	128	P2P	Edge	--
5	--	Disabled	200000	128	P2P	Edge	--
6	--	Disabled	200000	128	P2P	Edge	--
7	Designated	Forwarding	200000	128	P2P	Edge	--
8	--	Disabled	20000	128	P2P	Edge	--
9	--	Disabled	20000	128	P2P	Edge	--
10	--	Disabled	20000	128	P2P	Edge	--

This page allows you to see the information of the root switch and port status.

Root Information: You can see root Bridge ID, Root Priority, Root Port, Root Path Cost and the Max Age, Hello Time and Forward Delay of BPDU sent from the root switch.

Port Information: You can see port Role, Port State, Path Cost, Port Priority, Oper P2P mode, Oper edge port mode and Aggregated (ID/Type).

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

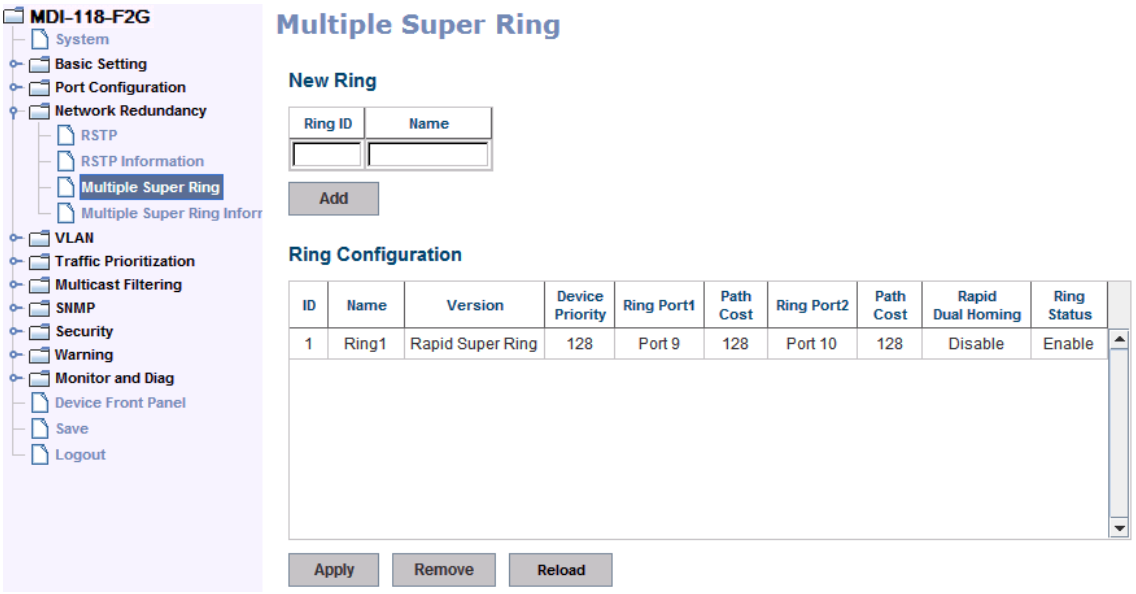
4.4.3 Multiple Super Ring (MSR)

The most common industrial network redundancy is to form a ring or loop. Typically, the managed switches are connected in series and the last switch is connected back to the first one.

The Multiple Super Ring has enhanced Ring Master selection and faster recovery time. It is also enhanced for more complex ring application.

This page allows you to enable the settings for Multiple Super Ring and Rapid Dual Homing.

New Ring: To create a Rapid Super Ring, just fill in the Ring ID which has range from 0 to 31. If the name field is left blank, the name of this ring will automatically naming with Ring ID.



Ring Configuration

ID: Once a Ring is created, this appears and can not be changed.

Name: This field will show the name of the Ring. If it is not filled in when creating, it will be automatically named by the rule “RingID”.

Version: The version of Ring can be changed here. There are three modes to choose: Rapid Super Ring as default.

Device Priority: The switch with highest priority (highest value) will be automatically selected as Ring Master. Then one of the ring ports in this switch will become forwarding port and the other one will become blocking port. If all of the switches have the same priority, the switch with the biggest MAC address will be selected as Ring Master.

Ring Port1: In Rapid Super Ring environment, you should have 2 Ring Ports. No matter this switch is Ring Master or not, when configuring RSR, 2 ports should be selected to be Ring Ports. For Ring Master, one of the ring ports will become the

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

forwarding port and the other one will become the blocking port.

Path Cost: Change the Path Cost of Ring Port1. If this switch is the Ring Master of a Ring, then it determines the blocking port. The Port with higher Path Cost in the two ring Port will become the blocking port, If the Path Cost is the same, the port with larger port number will become the blocking port.

Ring Port2: Assign another port for ring connection

Path Cost: Change the Path Cost of Ring Port2

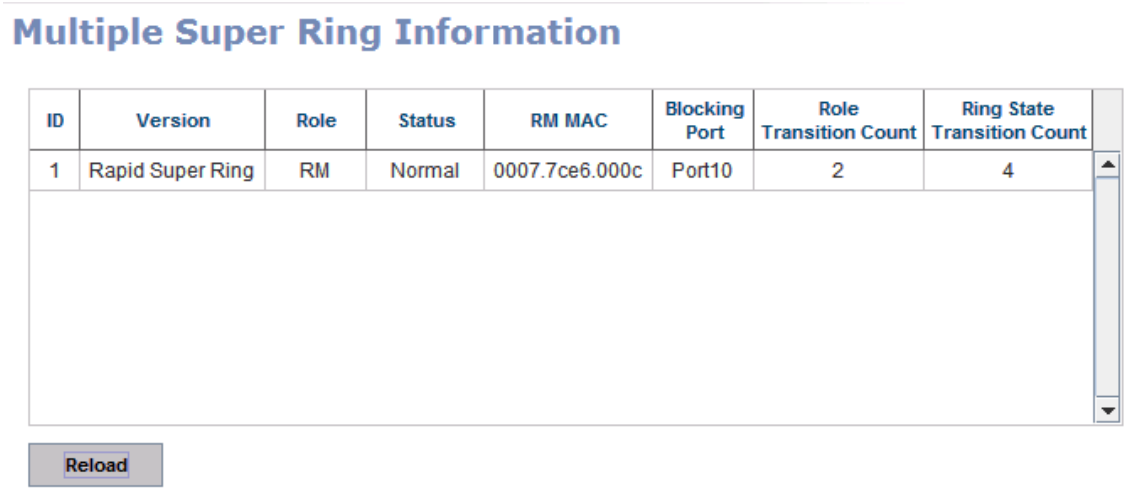
Rapid Dual Homing: Rapid Dual Homing is an important feature of MSR. When you want to connect multiple RSR or form a redundant topology with other vendors, RDH could allow you to have maximum 7 multiple links for redundancy without any problem.

In Rapid Dual Homing, you don't need to configure specific port to connect to other protocol. The Rapid Dual Homing will smartly choose the fastest link for primary link and block all the other links to avoid loop. If the primary link failed, Rapid Dual Homing will automatically forward the secondary link for network redundant. Of course, if there are more connections, they will be standby links and recover one of them if both primary and secondary links are broken.

Ring status: To enable/disable the Ring. Please remember to enable the ring after you add it.

4.4.4 Ring Info

This page shows the RSR information.



ID: Ring ID.

Version: which version of this ring, this field could be Rapid Super Ring, Super Ring.

Role: This Switch is RM or nonRM

Status: If this field is Normal which means the redundancy is approved. If any one

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

of the link in this Ring is broken, then the status will be Abnormal.

RM MAC: The MAC address of Ring Master of this Ring. It helps to find the redundant path.

Blocking Port: This field shows which is blocked port of RM.

Role Transition Count: This means how many times this switch has changed its Role from nonRM to RM or from RM to nonRM.

Role state Transition Count: This number means how many times the Ring status has been transformed between Normal and Abnormal state.

4.4.5 Command Lines:

Feature	Command Line
RSTP	
Enable	Switch(config)# spanning-tree enable
Disable	Switch (config)# spanning-tree disable
RSTP mode	Switch(config)# spanning-tree mode rapid-stp SpanningTree Mode change to be RSTP(802.1w) .
STP mode	Switch(config)# spanning-tree mode stp SpanningTree Mode change to be STP(802.1d) .
Priority	Switch(config)# spanning-tree priority <0-61440> valid range is 0 to 61440 in multiple of 4096 Switch(config)# spanning-tree priority 4096
Max Age	Switch(config)# spanning-tree max-age <6-40> Valid range is 6~40 seconds Switch(config)# spanning-tree max-age 10
Hello Time	Switch(config)# spanning-tree hello-time <1-10> Valid range is 1~10 seconds Switch(config)# spanning-tree hello-time 2
Forward Delay	Switch(config)# spanning-tree forward-time <4-30> Valid range is 4~30 seconds Switch(config)# spanning-tree forward-time 15
Port Path Cost	Switch(config-if)# spanning-tree cost <1-200000000> 16-bit based value range from 1-65535, 32-bit based value range from 1-200,000,000 Switch(config-if)# spanning-tree cost 200000
Port Priority	Switch(config-if)# spanning-tree port-priority

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	<0-240> Number from 0 to 240, in multiple of 16 Switch(config-if)# spanning-tree port-priority 128
Link Type - Auto	Switch(config-if)# spanning-tree link-type auto
Link Type - P2P	Switch(config-if)# spanning-tree link-type point-to-point
Link Type – Share	Switch(config-if)# spanning-tree link-type shared
Edge Port	Switch(config-if)# spanning-tree edge-port enable Switch(config-if)# spanning-tree edge-port disable
RSTP Info	
Active status	Switch# show spanning-tree active Rapid Spanning-Tree feature Enabled Spanning-Tree BPDU transmission-limit 3 Root Address 0007.7c01.0386 Priority 4096 Root Path Cost : 200000 Root Port : 7 Root Times : max-age 20 sec, hello-time 2 sec, forward-delay 15 sec Bridge Address 0007.7cff.0102 Priority 4096 Bridge Times : max-age 10 sec, hello-time 2 sec, forward-delay 15 sec Aging time : 300 Port Role Port-State Cost Prio.Nbr Type ------- ---------- ------------ --------- ---------- ----------- fa6 Designated Forwarding 200000 128.6 Auto(RST) fa7 Root Forwarding 200000 128.7 Shared(STP)
RSTP Summary	Switch# show spanning-tree summary Switch is in rapid-stp mode. BPDU skewing detection disabled for the bridge. Backbonefast disabled for bridge. Summary of connected spanning tree ports : #Port-State Summary Blocking Listening Learning Forwarding Disabled -------- --------- -------- ---------- -------- 0 0 0 2 8

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	#Port Link-Type Summary AutoDetected PointToPoint SharedLink EdgePort ----------- ----------- ---------- -------- 9 0 1 9
Port Info	Switch# show spanning-tree port detail fa7 (Interface_ID) Rapid Spanning-Tree feature Enabled Port 128.6 as Disabled Role is in Disabled State Port Path Cost 200000, Port Identifier 128.6 RSTP Port Admin Link-Type is Auto, Oper Link-Type is Point-to-Point RSTP Port Admin Edge-Port is Enabled, Oper Edge-Port is Edge Designated root has priority 32768, address 0007.7c00.0112 Designated bridge has priority 32768, address 0007.7c60.1aec Designated Port ID is 128.6, Root Path Cost is 600000 Timers : message-age 0 sec, forward-delay 0 sec Link Aggregation Group: N/A, Type: N/A, Aggregated with: N/A BPDU: sent 43759 , received 4854 TCN : sent 0 , received 0 Forwarding-State Transmit count 12 Message-Age Expired count
Multiple Super Ring	
Create or configure a Ring	Switch(config)# multiple-super-ring 1 Ring 1 created Switch(config-multiple-super-ring)# Note: 1 is the target Ring ID which is going to be created or configured.
Super Ring Version	Switch(config-multiple-super-ring)# version default set default to rapid super ring rapid-super-ring rapid super ring super-ring super ring

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	Switch(config-multiple-super-ring)# version rapid-super-ring
Priority	Switch(config-multiple-super-ring)# priority <0-255> valid range is 0 to 255 default set default Switch(config)# super-ring priority 100
Ring Port	Switch(config-multiple-super-ring)# port IFLIST Interface list, ex: fa1,fa3-5,gi8-10 cost path cost Switch(config-multiple-super-ring)# port fa1,fa2
Ring Port Cost	Switch(config-multiple-super-ring)# port cost <0-255> valid range is 0 or 255 default set default (128)valid range is 0 or 255 Switch(config-multiple-super-ring)# port cost 100 <0-255> valid range is 0 or 255 default set default (128)valid range is 0 or 255 Switch(config-super-ring-plus)# port cost 100 200 Set path cost success.
Rapid Dual Homing	Switch(config-multiple-super-ring)# rapid-dual-homing enable Switch(config-multiple-super-ring)# rapid-dual-homing disable Switch(config-multiple-super-ring)# rapid-dual-homing port IFLIST Interface name, ex: fastethernet1 or gi8 auto-detect up link auto detection IFNAME Interface name, ex: fastethernet1 or gi8 Switch(config-multiple-super-ring)# rapid-dual-homing port fa3,fa5-6 set Rapid Dual Homing port success. Note: auto-detect is recommended for dual Homing..
Ring Info	
Ring Info	Switch# show multiple-super-ring [Ring ID] [Ring1] Ring1 Current Status : Disabled Role : Disabled

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	Ring Status : Abnormal Ring Manager : 0000.0000.0000 Blocking Port : N/A Giga Copper : N/A Configuration : Version : Rapid Super Ring Priority : 128 Ring Port : fa1, fa2 Path Cost : 100, 200 Dual-Homing II : Disabled Statistics : Watchdog sent 0, received 0, missed 0 Link Up sent 0, received 0 Link Down sent 0, received 0 Role Transition count 0 Ring State Transition count 1 Ring ID is optional. If the ring ID is typed, this command will only display the information of the target Ring.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.5 VLAN

A Virtual LAN (VLAN) is a “logical” grouping of nodes for the purpose of limiting a broadcast domain to specific members of a group without physically grouping the members together. That means, VLAN allows you to isolate network traffic so that only members of VLAN could receive traffic from the same VLAN members. Basically, creating a VLAN from a switch is the logical equivalent of physically reconnecting a group of network devices to another Layer 2 switch, without actually disconnecting these devices from their original switches.

The switch supports 802.1Q VLAN. 802.1Q VLAN is also known as Tag-Based VLAN. This Tag-Based VLAN allows VLAN to be created across different switches (see Figure 1). IEEE 802.1Q tag-based VLAN makes use of VLAN control information stored in a VLAN header attached to IEEE 802.3 packet frames. This tag contains a VLAN Identifier (VID) that indicates which VLAN a frame belongs to. Since each switch only has to check a frame’s tag, without the need to dissect the contents of the frame, this also saves a lot of computing resources within the switch.

VLAN Configuration group enables you to Add/Remove VLAN, configure port Ingress/Egress parameters and view VLAN table.

Following commands are included in this group:

4.5.1 VLAN Port Configuration

4.5.2 VLAN Configuration

4.5.3 GVRP Configuration

4.5.4 VLAN Table

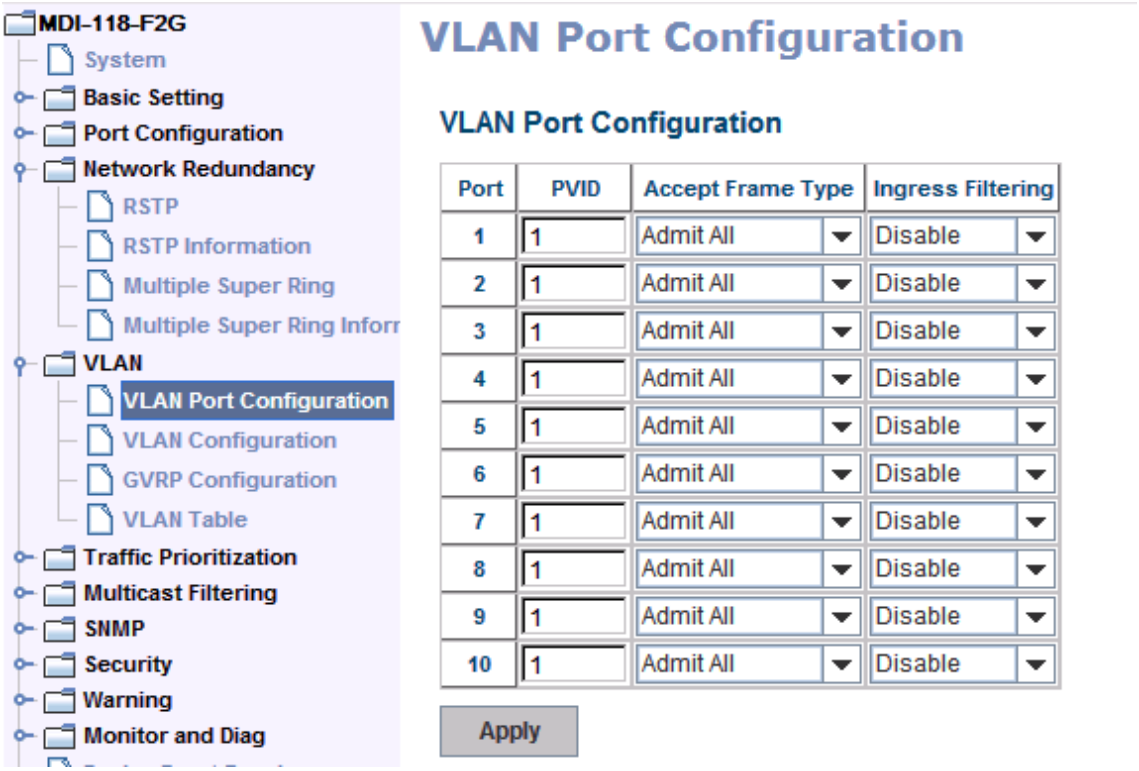
4.5.5 CLI Commands of the VLAN

4.5.1 VLAN Port Configuration

VLAN Port Configuration allows you to set up VLAN port parameters to specific port. These parameters include PVID, Accept Frame Type and Ingress Filtering.

Figure 4.5.2 Web UI of VLAN configuration.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



PVID: The abbreviation of the **Port VLAN ID**. Enter port VLAN ID here. PVID allows the switches to identify which port belongs to which VLAN. To keep things simple, it is recommended that PVID is equivalent to VLAN IDs.

The values of PVIDs are from 0 to 4095. But, 0 and 4095 are reserved. You can't input these 2 PVIDs. 1 is the default value. 2 to 4094 are valid and available in this column. Type the PVID you'd like to configure here.

Accept Frame Type: This column defines the accepted frame type of the port. There are 2 modes you can select, **Admit All** and **Tag Only**. Admit All mode means that the port can accept both tagged and untagged packets. Tag Only mode means that the port can only accept tagged packets.

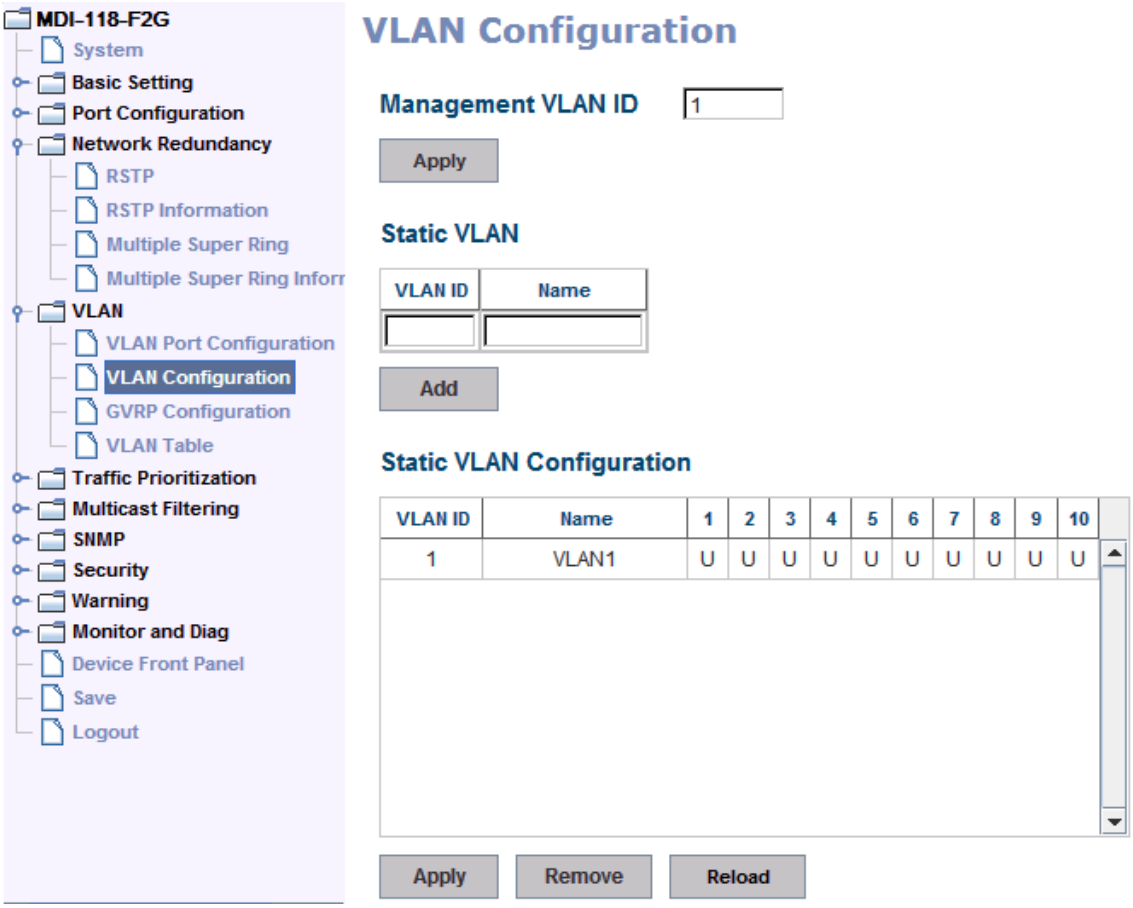
Ingress Filtering: Ingress filtering helps VLAN engine to filter out undesired traffic on a port. When Ingress Filtering is enabled, the port checks whether the incoming frames belong to the VLAN they claimed or not. Then the port determines if the frames can be processed or not. For example, if a tagged frame from Engineer VLAN is received, and Ingress Filtering is enabled, the switch will determine if the port is on the Engineer VLAN's Egress list. If it is, the frame can be processed. If it's not, the frame would be dropped.

4.5.2 VLAN Configuration

In this page, you can assign Management VLAN, create the static VLAN, and assign the Egress rule for the member ports of the VLAN.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Figure 4.5.2.1 Web UI of the VLAN Configuration.



Management VLAN ID: The switch supports management VLAN. The management VLAN ID is the VLAN ID of the CPU interface so that only member ports of the management VLAN can ping and access the switch. The default management VLAN ID is **1**.

Static VLAN: You can assign a VLAN ID and VLAN Name for new VLAN here.

VLAN ID is used by the switch to identify different VLANs. Valid VLAN ID is between 1 and 4094. 1 is the default VLAN.

VLAN Name is a reference for network administrator to identify different VLANs. The available character is 12 for you to input. If you don't input VLAN name, the system will automatically assign VLAN name for the VLAN. The rule is VLAN (VLAN ID).

The steps to create a new VLAN: Type VLAN ID and NAME, and press **Add** to create a new VLAN. Then you can see the new VLAN in the Static VLAN Configuration table.

After created the VLAN, the status of the VLAN will remain in Unused until you add ports to the VLAN.

Note: Before you change the management VLAN ID by Web and Telnet, remember that the port attached by the administrator should be the member

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

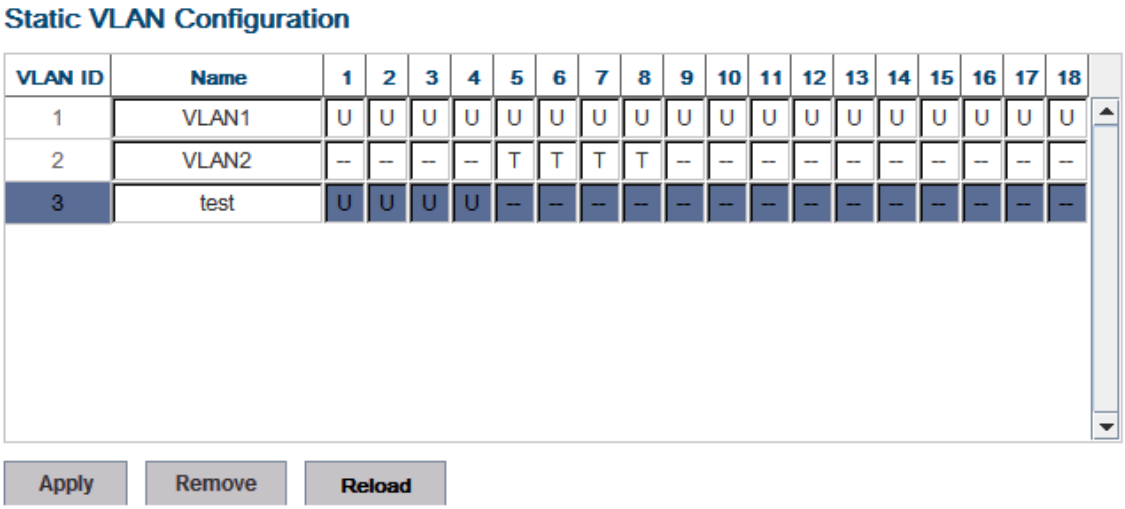
port of the management VLAN; otherwise the administrator can't access the switch via the network.

Note: Currently the switch only support max 255 group VLAN.

Static VLAN Configuration

You can see the created VLANs and specify the egress (outgoing) port rule to be **Untagged or Tagged** here.

Figure 4.5.2.3 Static VLAN Configuration table. You can see that new VLAN 3 is created. VLAN name is test. Egress rules of the ports are not configured now.



-- : Not available

U: **Untag**: Indicates that egress/outgoing frames are not VLAN tagged.

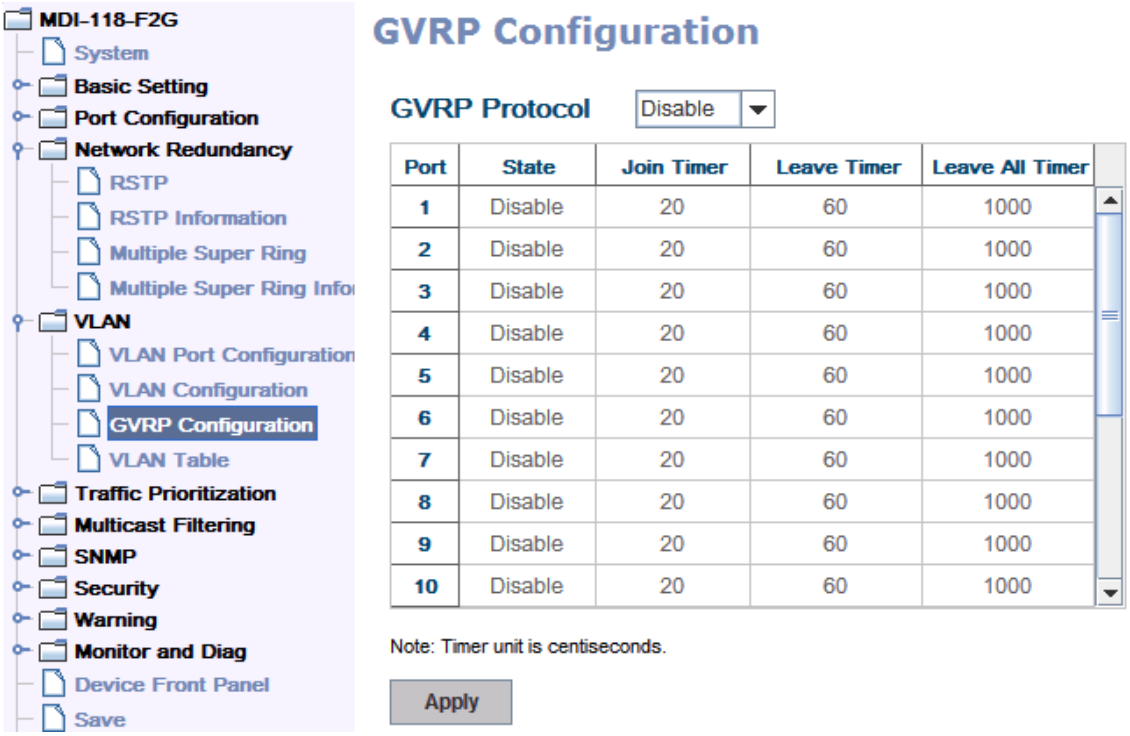
T : **Tag**: Indicates that egress/outgoing frames are to be VLAN tagged.

Steps to configure Egress rules: Select the VLAN ID. Entry of the selected VLAN turns to light blue. Assign Egress rule of the ports to **U** or **T**. Press **Apply** to apply the setting. If you want to remove one VLAN, select the VLAN entry. Then press **Remove** button.

4.5.3 GVRP configuration

GVRP allows users to set-up VLANs automatically rather than manual configuration on every port of every switch in the network.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



GVRP Protocol: Allow user to enable/disable GVRP globally.

State: After enable GVRP globally, here still can enable/disable GVRP by port.

Join Timer: Controls the interval of sending the GVRP Join BPDU. An instance of this timer is required on a per-Port, per-GARP Participant basis

Leave Timer: Control the time to release the GVRP reservation after received the GVRP Leave BPDU. An instance of the timer is required for each state machine that is in the LV state

Leave All Timer: Controls the period to initiate the garbage collection of registered VLAN. The timer is required on a per-Port, per-GARP Participant basis

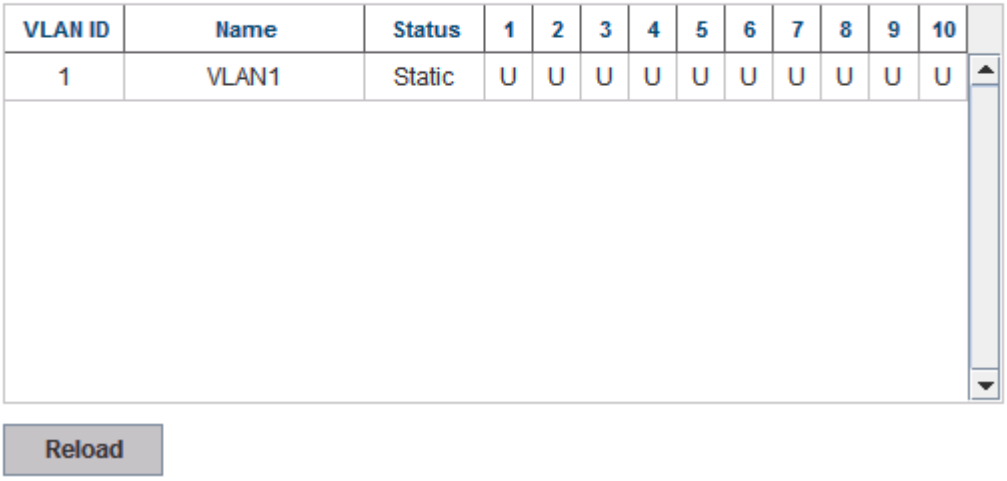
4.5.4 VLAN Table

This table shows you current settings of your VLAN table, including VLAN ID, Name, Status, and Egress rule of the ports.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

VLAN Table

VLAN Table



VLAN ID: ID of the VLAN.

Name: Name of the VLAN.

Status: Static shows this is a manually configured static VLAN. **Unused** means this VLAN is created by UI/CLI and has no member ports. This VLAN is not workable yet. **Dynamic** means this VLAN is learnt by GVRP.

After created the VLAN, the status of this VLAN will remain in Unused status until you add ports to the VLAN.

4.5.5 CLI Commands of the VLAN

Command Lines of the VLAN port configuration, VLAN configuration and VLAN table display

Feature	Command Line
VLAN Port Configuration	
VLAN Port PVID	Switch(config-if)# switchport trunk native vlan 2 Set port default vlan id to 2 success
Port Accept Frame Type	Switch(config)# inter fa1 Switch(config-if)# acceptable frame type all any kind of frame type is accepted! Switch(config-if)# acceptable frame type vlantaggedonly only vlan-tag frame is accepted!
Ingress Filtering	Switch(config)# interface fa1

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

(for fast Ethernet port 1)	Switch(config-if)# ingress filtering enable ingress filtering enable Switch(config-if)# ingress filtering disable ingress filtering disable
Egress rule – Untagged (for VLAN 2)	Switch(config-if)# switchport access vlan 2 switchport access vlan - success
Egress rule – Tagged (for VLAN 2)	Switch(config-if)# switchport trunk allowed vlan add 2
Display – Port Ingress Rule (PVID, Ingress Filtering, Acceptable Frame Type)	Switch# show interface fa1 Interface fastethernet1 Administrative Status : Enable Operating Status : Not Connected Duplex : Auto Speed : Auto Flow Control :off Default Port VLAN ID: 2 Ingress Filtering : Disabled Acceptable Frame Type : All Port Security : Disabled Auto Negotiation : Enable Loopback Mode : None STP Status: disabled Default CoS Value for untagged packets is 0. Mdix mode is Auto. Medium mode is Copper.
Display – Port Egress Rule (Egress rule, IP address, status)	Switch# show running-config …… ! interface fastethernet1 switchport access vlan 1 switchport access vlan 3 switchport trunk native vlan 2 ……. interface vlan1 ip address 192.168.2.8/24 no shutdown
VLAN Configuration	
Create VLAN (2)	Switch(config)# vlan 2

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	vlan 2 success Switch(config)# interface vlan 2 Switch(config-if)# Note: In CLI configuration, you should create a VLAN interface first. Then you can start to add/remove ports. Default status of the created VLAN is unused until you add member ports to it.
Remove VLAN	Switch(config)# no vlan 2 no vlan success Note: You can only remove the VLAN when the VLAN is in unused mode.
VLAN Name	Switch(config)# vlan 2 vlan 2 has exists Switch(config-vlan)# name v2 Switch(config-vlan)# no name Note: Use no name to change the name to default name, VLAN VID.
VLAN description	Switch(config)# interface vlan 2 Switch(config-if)# Switch(config-if)# description this is the VLAN 2 Switch(config-if)# no description ->Delete the description.
IP address of the VLAN	Switch(config)# interface vlan 2 Switch(config-if)# Switch(config-if)# ip address 192.168.2.200/24 Switch(config-if)# no ip address 192.168.2.200/24 ->Delete the IP address
Create multiple VLANs (VLAN 5-10)	Switch(config)# interface vlan 5-10
Shut down VLAN	Switch(config)# interface vlan 2 Switch(config-if)# shutdown

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	Switch(config-if)# no shutdown ->Turn on the VLAN
Display – VLAN table	Switch# sh vlan VLAN Name Status Trunk Ports Access Ports ---- ------------ ------- --- 1 VLAN1 Static - fa1-7,gi8-10 2 VLAN2 Unused - - 3 test Static fa4-7,gi8-10 fa1-3,fa7,gi8-10
Display – VLAN interface information	Switch# show interface vlan1 interface vlan1 is up, line protocol detection is disabled index 14 metric 1 mtu 1500 <UP,BROADCAST,RUNNING,MULTICAST> HWaddr: 00:07:7c:ff:01:b0 inet 192.168.2.200/24 broadcast 192.168.2.255 input packets 639, bytes 38248, dropped 0, multicast packets 0 input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 0, missed 0 output packets 959, bytes 829280, dropped 0 output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0, window 0 collisions 0
GVRP configuration	
GVRP enable/disable	Switch(config)# gvrp mode disable Disable GVRP feature globally on the switch enable Enable GVRP feature globally on the switch Switch(config)# gvrp mode enable Gvrp is enabled on the switch!
Configure GVRP timer Join timer /Leave timer/ LeaveAll	Switch(config)# inter fa1 Switch(config-if)# garp timer <10-10000> Switch(config-if)# garp timer 20 60 1000 Note: The unit of these timer is centisecond

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

timer	
Management VLAN	
Management VLAN	Switch(config)# int vlan 1 (Go to management VLAN) Switch(config-if)# no shutdown
Display	Switch# show running-config ! interface vlan1 ip address 192.168.2.200/24 ip igmp no shutdown !

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.6 Traffic Prioritization

Quality of Service (QoS) provides traffic prioritization mechanism which allows users to deliver better service to certain flows. QoS can also help to alleviate congestion problems and ensure high-priority traffic is delivered first. This section allows you to configure Traffic Prioritization settings for each port with regard to setting priorities.

The switch QOS supports 4 physical queues, weighted fair queuing (WRR) and Strict Priority scheme, which follows 802.1p COS tag and IPv4 TOS/DiffServ information to prioritize the traffic of your industrial network.

Following commands are included in this group:

4.6.1 QoS Setting

4.6.2 QoS Priority Mode

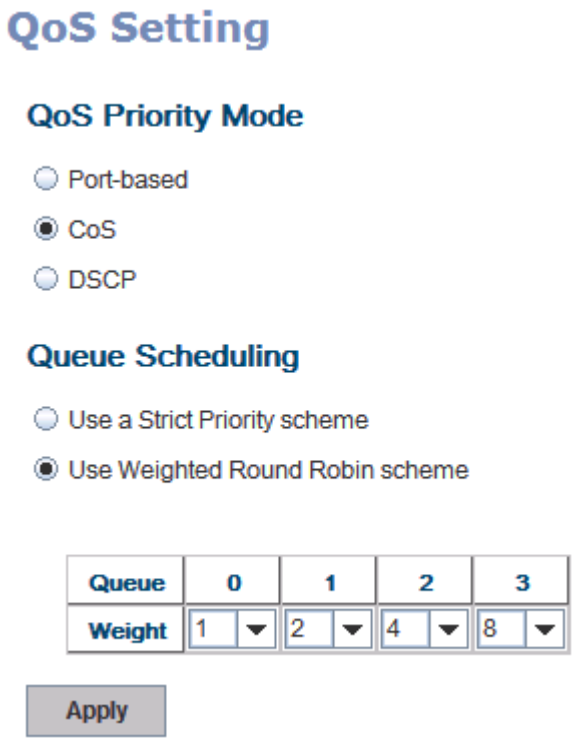
4.6.3 CoS-Queue Mapping

4.6.4 DSCP-Queue Mapping

4.6.5 CLI Commands of the Traffic Prioritization

4.6.1 QoS Setting

In QoS setting, you should choose the QoS Priority Mode first, Port-Based, Cos or DSCP modes. Choose the preferred mode and you can configure the next settings in its own configuration pages. The other page of the mode you don't select can't be configured.



Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Queue Scheduling

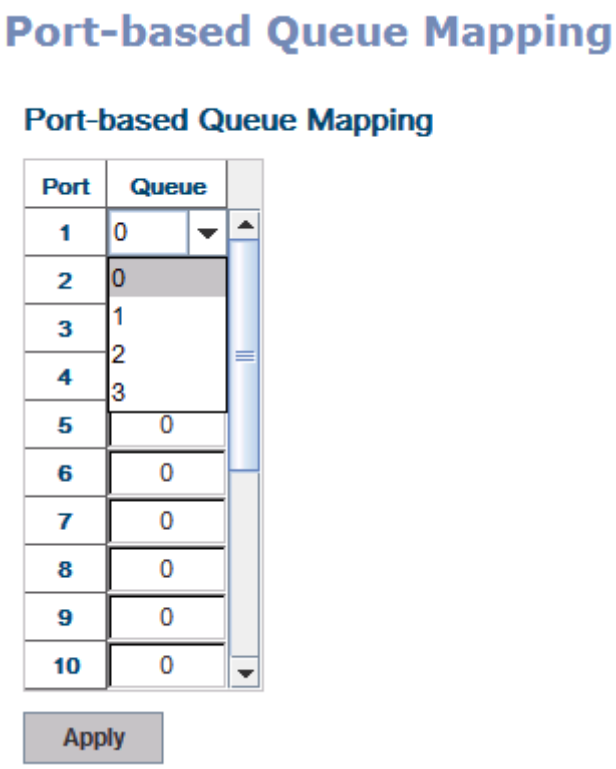
You can select the Queue Scheduling rule as follows:

Use a strict priority scheme. Packets with higher priority in the queue will always be processed first, except that there is no packet with higher priority.

Use Weighted Round Robin scheme. This scheme allows users to assign new weight ratio for each class. The 10 is the highest ratio. The ratio of each class is as below:

Wx / W0 + W1 + W2 + W3 + W4 + W5 + W6 + W7 (Total volume of Queue 0-7)

4.6.2 Port-based Queue Mapping



Choose the Queue value of each port, the port then has its default priority. The Queue 3 is the highest port-based queue, 0 is the lowest queue. The traffic injected to the port follows the queue level to be forwarded, but the outgoing traffic doesn't bring the queue level to next switch.

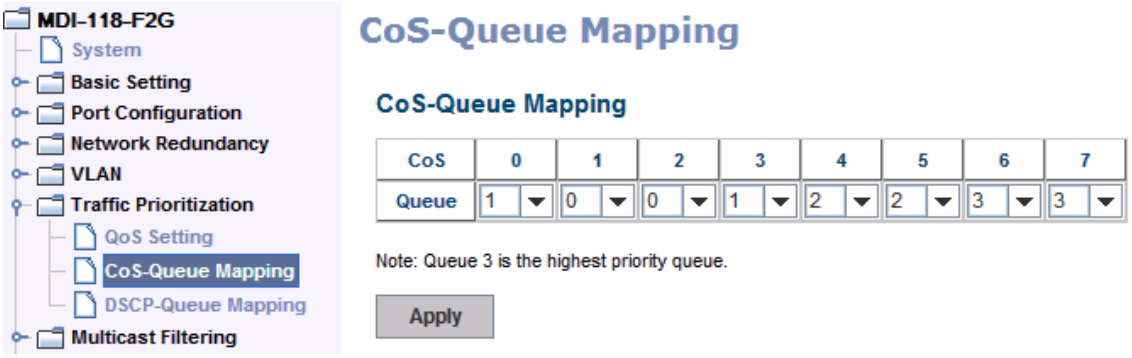
After configuration, press **Apply** to enable the settings.

4.6.3 CoS-Queue Mapping

This page is to change CoS values to Physical Queue mapping table. Since the switch fabric supports 4 physical queues, Lowest, Low, Middle and High. Users should therefore assign how to map CoS value to the level of the physical queue.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Users can freely assign the mapping table or follow the suggestion of the 802.1p standard. uses 802.p suggestion as default values. You can find CoS values 1 and 2 are mapped to physical Queue 0, the lowest queue. CoS values 0 and 3 are mapped to physical Queue 1, the low/normal physical queue. CoS values 4 and 5 are mapped to physical Queue 2, the middle physical queue. CoS values 6 and 7 are mapped to physical Queue 3, the high physical queue.

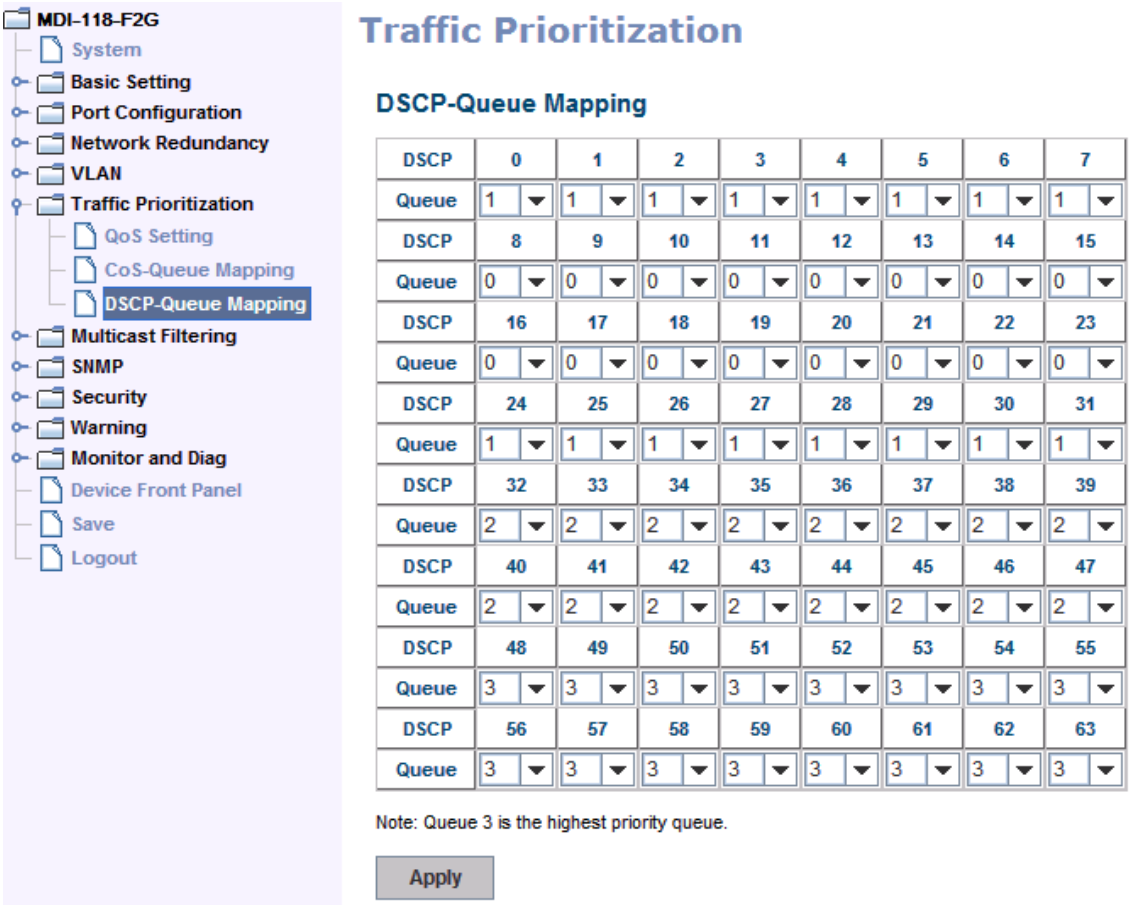


After configuration, press **Apply** to enable the settings.

4.6.4 DSCP-Queue Mapping

This page is to change DSCP values to Physical Queue mapping table. Since the switch fabric supports 4 physical queues, Lowest, Low, Middle and High. Users should therefore assign how to map DSCP value to the level of the physical queue. Users can freely change the mapping table to follow the upper layer 3 switch or routers' DSCP setting.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com


MDI-118-F2G
System
Basic Setting
Port Configuration
Network Redundancy
VLAN
Traffic Prioritization
QoS Setting
CoS-Queue Mapping
DSCP-Queue Mapping
Multicast Filtering
SNMP
Security
Warning
Monitor and Diag
Device Front Panel
Save
Logout
Traffic Prioritization
DSCP-Queue Mapping
DSCP 0 1 2 3 4 5 6 7
Queue 1 1 1 1 1 1 1 1
DSCP 8 9 10 11 12 13 14 15
Queue 0 0 0 0 0 0 0 0
DSCP 16 17 18 19 20 21 22 23
Queue 0 0 0 0 0 0 0 0
DSCP 24 25 26 27 28 29 30 31
Queue 1 1 1 1 1 1 1 1
DSCP 32 33 34 35 36 37 38 39
Queue 2 2 2 2 2 2 2 2
DSCP 40 41 42 43 44 45 46 47
Queue 2 2 2 2 2 2 2 2
DSCP 48 49 50 51 52 53 54 55
Queue 3 3 3 3 3 3 3 3
DSCP 56 57 58 59 60 61 62 63
Queue 3 3 3 3 3 3 3 3
Note: Queue 3 is the highest priority queue.
Apply

After configuration, press **Apply** to enable the settings.

4.6.5 CLI Commands of the Traffic Prioritization

Command Lines of the Traffic Prioritization configuration

Feature	Command Line
QoS Setting	

Queue Scheduling – Strict Priority	Switch(config)# qos queue-sched
	  sp Strict Priority
	  wrr Weighted Round Robin
	Switch(config)# qos queue-sched sp
	The queue scheduling scheme is setting to Strict Priority.

Queue Scheduling – Round Robin	Switch(config)# qos queue-sched rr The queue scheduling scheme is setting to Round Robin.
Queue Scheduling - WRR	Switch(config)# qos queue-sched wrr <1-10> Weights for COS queue 0 (queue_id 0) Switch(config)# qos queue-sched wrr 10 <1-10> Weights for COS queue 1 (queue_id 1)

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	…….. Switch(config)# qos queue-sched wrr 1 2 3 4 The queue scheduling scheme is setting to Weighted Round Robin. ***Assign the ratio for the 4 classes of service.***
Port Setting – CoS (Default Port Priority)	Switch(config)# interface **fa1** Switch(config-if)# qos priority DEFAULT-PRIORITY Assign an priority (3 highest) Switch(config-if)# qos priority 3 The default port priority value is set 3 ok. ***Note: When change the port setting, you should Select the specific port first. Ex: fa1 means fast Ethernet port 1.***
Display - Queue Scheduling	Switch# show qos queue-sched QoS queue scheduling scheme : Weighted Round Robin COS queue 0 = 1 COS queue 1 = 2 COS queue 2 = 3 COS queue 3 = 4
Display – Port Priority Setting (Port Default Priority)	Switch# show qos port-priority Port Default Priority : Port Priority -----+---- 1 7 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	11 0 12 0 13 0 14 0 15 0 16 0 17 0 18 0
CoS-Queue Mapping	
Format	Switch(config)# qos cos-map PRIORITY Assign an priority (7 highest) Switch(config)# qos cos-map 1 QUEUE Assign an queue (0-3) ***Note: Format: qos cos-map priority_value queue_value***
Map CoS 0 to Queue 1	Switch(config)# qos cos-map 0 1 The CoS to queue mapping is set ok.
Map CoS 1 to Queue 0	Switch(config)# qos cos-map 1 0 The CoS to queue mapping is set ok.
Map CoS 2 to Queue 0	Switch(config)# qos cos-map 2 0 The CoS to queue mapping is set ok.
Map CoS 3 to Queue 1	Switch(config)# qos cos-map 3 1 The CoS to queue mapping is set ok.
Map CoS 4 to Queue 2	Switch(config)# qos cos-map 4 2 The CoS to queue mapping is set ok.
Map CoS 5 to Queue 2	Switch(config)# qos cos-map 5 2 The CoS to queue mapping is set ok.
Map CoS 6 to Queue 3	Switch(config)# qos cos-map 6 3 The CoS to queue mapping is set ok.
Map CoS 7 to Queue 3	Switch(config)# qos cos-map 7 3 The CoS to queue mapping is set ok.
Display – CoS-Queue mapping	Switch# sh qos cos-map CoS to Queue Mapping : CoS Queue ---- + ------

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	0 1 1 0 2 0 3 1 4 2 5 2 6 3 7 3
DSCP-Queue Mapping	
Format	Switch(config)# qos dscp-map PRIORITY Assign an priority (63 highest) Switch(config)# qos dscp-map 0 QUEUE Assign an queue (0-3) ***Format: qos dscp-map priority_value queue_value***
Map DSCP 0 to Queue 1	Switch(config)# qos dscp-map 0 1 The TOS/DSCP to queue mapping is set ok.
Display – DSCO-Queue mapping	Switch# show qos dscp-map DSCP to Queue Mapping : (dscp = d1 d2) d2| 0 1 2 3 4 5 6 7 8 9 d1 | -----+---------- 0 | 1 1 1 1 1 1 1 1 0 0 1 | 0 0 0 0 0 0 0 0 0 0 2 | 0 0 0 0 1 1 1 1 1 1 3 | 1 1 2 2 2 2 2 2 2 2 4 | 2 2 2 2 2 2 2 2 3 3 5 | 3 3 3 3 3 3 3 3 3 3 6 | 3 3 3 3

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.7 Multicast Filtering

For multicast filtering, the switch uses IGMP Snooping technology. IGMP (Internet Group Management Protocol) is an Internet Protocol that provides a way for internet device to report its multicast group membership to adjacent routers. Multicasting allows one computer on the internet to send data to a multitude of other computers that have identified themselves as being interested in receiving the originating computers data.

Multicasting is useful for such applications as updating the address books of mobile computer users in the field, sending out newsletters to a distribution list, and broadcasting streaming media to an audience that has tuned into the event by setting up multicast group membership.

In effect, IGMP Snooping manages multicast traffic by making use of switches, routers, and hosts that support IGMP. Enabling IGMP Snooping allows the ports to detect IGMP queries, report packets, and manage multicast traffic through the switch. IGMP has three fundamental types of messages, as shown below:

Message	Description
Query	A message sent from the querier (an IGMP router or a switch) which asks for a response from each host that belongs to the multicast group.
Report	A message sent by a host to the querier to indicate that the host wants to be or is a member of a given group indicated in the report message.
Leave Group	A message sent by a host to the querier to indicate that the host has quit as a member of a specific multicast group.

You can enable **IGMP Snooping** and **IGMP Query** functions here. You will see the information of the IGMP Snooping function in this section, including different multicast groups' VID and member ports, and IP multicast addresses that range from 224.0.0.0 to 239.255.255.255.

In this section, Force filtering can determined whether the switch flooding unknown multicast or not.

Following commands are included in this group:

4.7.1 IGMP Snooping

4.7.2 IGMP Query

4.7.3 Force Filtering

4.7.4 CLI Commands of the Multicast Filtering

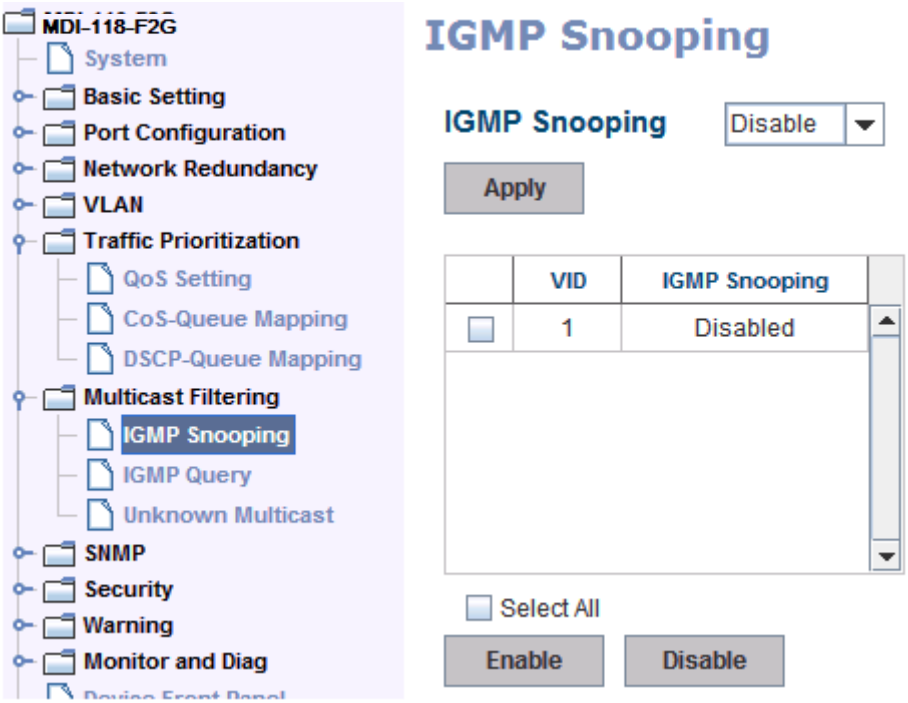
Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.7.1 IGMP Snooping

This page is to enable IGMP Snooping feature, assign IGMP Snooping for specific VLAN, and view IGMP Snooping table from dynamic learnt or static manual key-in. The switch supports IGMP snooping V1/V2/V3 automatically and IGMP query V1/V2.

IGMP Snooping, you can select **Enable** or **Disable** here. After enabling IGMP Snooping, you can then enable IGMP Snooping for specific VLAN. You can enable IGMP Snooping for some VLANs so that some of the VLANs will support IGMP Snooping and others won't.

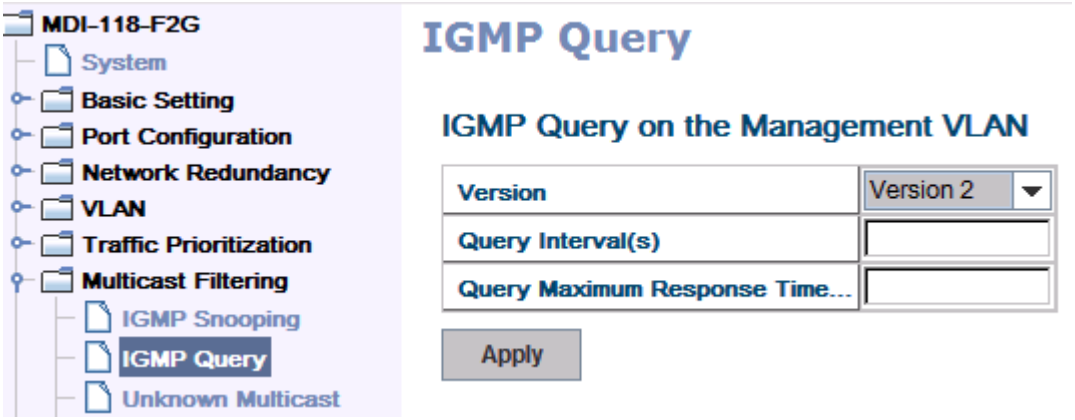
To assign IGMP Snooping to VLAN, please select the **checkbox** of VLAN ID or select **Select All** checkbox for all VLANs. Then press **Enable**. In the same way, you can also **Disable** IGMP Snooping for certain VLANs.



IGMP Snooping Table: In the table, you can see multicast group IP address, VLAN ID it belongs to, and member ports of the multicast group. The switch supports 256 multicast groups. Click on **Reload** to refresh the table.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.7.2 IGMP Query



This page allows users to configure **IGMP Query** feature. Since the switch can only be configured by member ports of the management VLAN, IGMP Query can only be enabled on the management VLAN. If you want to run IGMP Snooping feature in several VLANs, you should notice that whether each VLAN has its own IGMP Querier first.

The IGMP querier periodically sends query packets to all end-stations on the LANs or VLANs that are connected to it. For networks with more than one IGMP querier, a switch with the lowest IP address becomes the IGMP querier.

In IGMP Query selection, you can select V1, V2 or Disable. **V1** means IGMP V1 General Query and **V2** means IGMP V2 General Query.. The query will be forwarded to all multicast groups in the VLAN. **Disable** allows you to disable IGMP Query.

Query Interval(s): The period of query sent by querier.

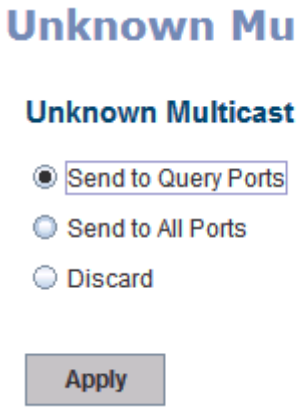
Query Maximum Response Time: The span querier detect to confirm there are no more directly connected group members on a LAN.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Once you finish configuring the settings, click on **Apply** to apply your configuration.

4.7.3 Unknown Multicast

After enabled IGMP Snooping, the known multicast can be filtered by IGMP Snooping mechanism and forwarded to the member ports of the known multicast groups. The other multicast streams which are not leant is so-called unknown multicast, the switch decide how to forward them based on the setting of this page.



Send to Query Ports: The unknown multicast will be sent to the Query ports. The Query port means the port received the IGMP Query packets. It is usually the uplink port of the switch.

Send to All Ports: The unknown multicast will be flooded to all ports even they are not the member ports of the groups.

Discard: The unknown multicast will be discarded. Non-member ports will not receive the unknown multicast streams.

4.7.4 CLI Commands of the Multicast Filtering

Command Lines of the multicast filtering configuration

Feature	Command Line
IGMP Snooping	
IGMP Snooping - Global	Switch(config)# ip igmp snooping IGMP snooping is enabled globally. Please specify on which vlans IGMP snooping enables
IGMP Snooping - VLAN	Switch(config)# ip igmp snooping vlan VLANLIST allowed vlan list all all existed vlan Switch(config)# ip igmp snooping vlan 1-2 IGMP snooping is enabled on VLAN 1-2.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Disable IGMP Snooping - Global	Switch(config)# no ip igmp snooping IGMP snooping is disabled globally ok.
Disable IGMP Snooping - VLAN	Switch(config)# no ip igmp snooping vlan 3 IGMP snooping is disabled on VLAN 3.
Display – IGMP Snooping Setting	Switch# sh ip igmp interface vlan1 enabled: Yes version: IGMPv1 query-interval; 125s query-max-response-time: 10s Switch# sh ip igmp snooping IGMP snooping is globally enabled Vlan1 is IGMP snooping enabled Vlan2 is IGMP snooping enabled Vlan3 is IGMP snooping disabled
Display – IGMP Table	Switch# sh ip igmp snooping multicast all VLAN IP Address Type Ports ---- --------------- ------- ------------------------ 1 239.192.8.0 IGMP fa6, 1 239.255.255.250 IGMP fa6,
IGMP Query	
IGMP Query V1	Switch(config)# int vlan 1 (Go to management VLAN) Switch(config-if)# ip igmp v1
IGMP Query V2	Switch(config)# int vlan 1 (Go to management VLAN) Switch(config-if)# ip igmp
IGMP Query version	Switch(config-if)# ip igmp version 1 Switch(config-if)# ip igmp version 2
Disable	Switch(config)# int vlan 1 Switch(config-if)# no ip igmp
Display	Switch# sh ip igmp interface vlan1 enabled: Yes version: IGMPv2 query-interval: 125s

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	query-max-response-time: 10s Switch# show running-config …. ! interface vlan1 ip address 192.168.2.200/24 ip igmp no shutdown ! …….
Unknown Multicast	
Unknown Multicast - Enable Force filtering (Send to All Ports) Disable Force filtering (Discard)	Switch(config)# mac-address-table multicast filtering Filtering unknown multicast addresses ok! Switch(config)# no mac-address-table multicast filtering Flooding unknown multicast addresses ok!
Unknown Multicast – Send to All Ports	Switch(config)# ip igmp snooping source-only-learning

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.8 SNMP

Simple Network Management Protocol (SNMP) is a protocol used for exchanging management information between network devices. SNMP is a member of the TCP/IP protocol suite. The switch series support SNMP v1 and v2c and V3.

An SNMP managed network consists of two main components: agents and a manager. An agent is a management software module that resides in a managed switch. An agent translates the local management information from the managed device into a SNMP compatible format. The manager is the console through the network.

Following commands are included in this group:

4.8.1 SNMP Configuration

4.8.2 SNMPv3 Profile

4.8.3 SNMP Traps

4.8.4 SNMP CLI Commands for SNMP

4.8.1 SNMP Configuration

This page allows users to configure SNMP V1/V2c Community. The community string can be viewed as the password because SNMP V1/V2c doesn't request you to enter password before you try to access SNMP agent.

The community includes 2 privileges, Read Only and Read and Write.

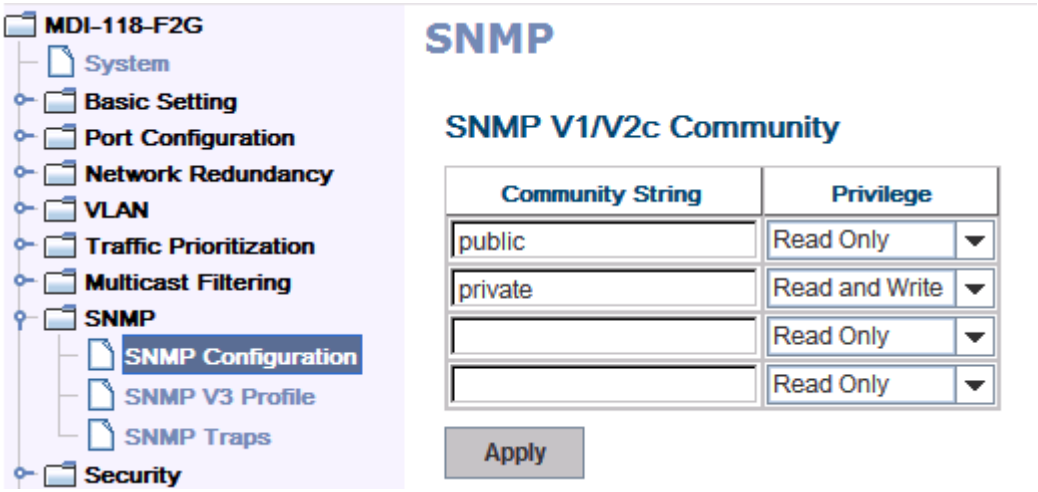
With **Read Only** privilege, you only have the ability to read the values of MIB tables. Default community string is Public.

With **Read and Write** privilege, you have the ability to read and set the values of MIB tables. Default community string is Private.

The switch allows users to assign 4 community strings. Type the community string and select the privilege. Then press **Apply**.

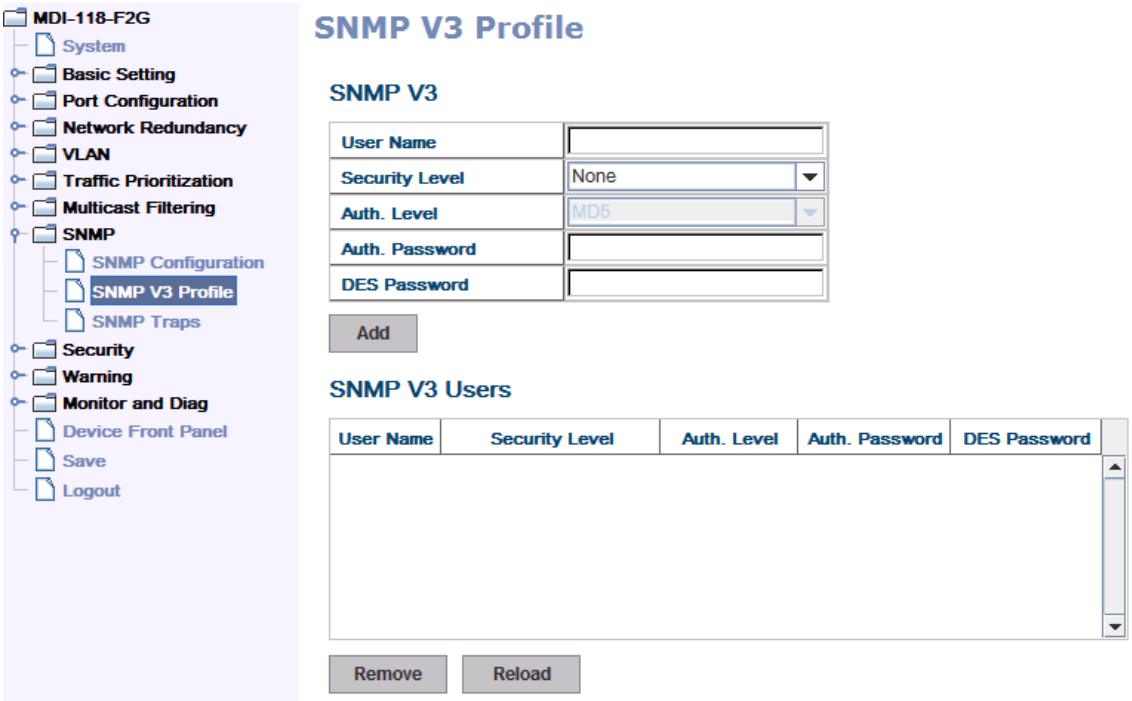
Note: When you first install the device in your network, we highly recommend you to change the community string. Since most SNMP management application uses Public and Private as their default community name, this might be the leakage of the network security.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



4.8.2 SNMP V3 Profile

SNMP v3 can provide more security functions when the user performs remote management through SNMP protocol. It delivers SNMP information to the administrator with user authentication; all of data between the switch and the administrator are encrypted to ensure secure communication.



Security Level: Here the user can select the following levels of security: None, User Authentication, and Authentication with privacy.

Authentication Protocol: Here the user can select either MD5 (Message-Digest algorithm 5) or SHA (Secure Hash Algorithm). MD5 is a widely used cryptographic hash function with a 128-bit hash value. SHA (Secure Hash Algorithm) hash

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

functions refer to five Federal Information Processing Standard-approved algorithms for computing a condensed digital representation. The switch provides 2 user authentication protocols in MD5 and SHA. You will need to configure SNMP v3 parameters for your SNMP tool with the same authentication method.

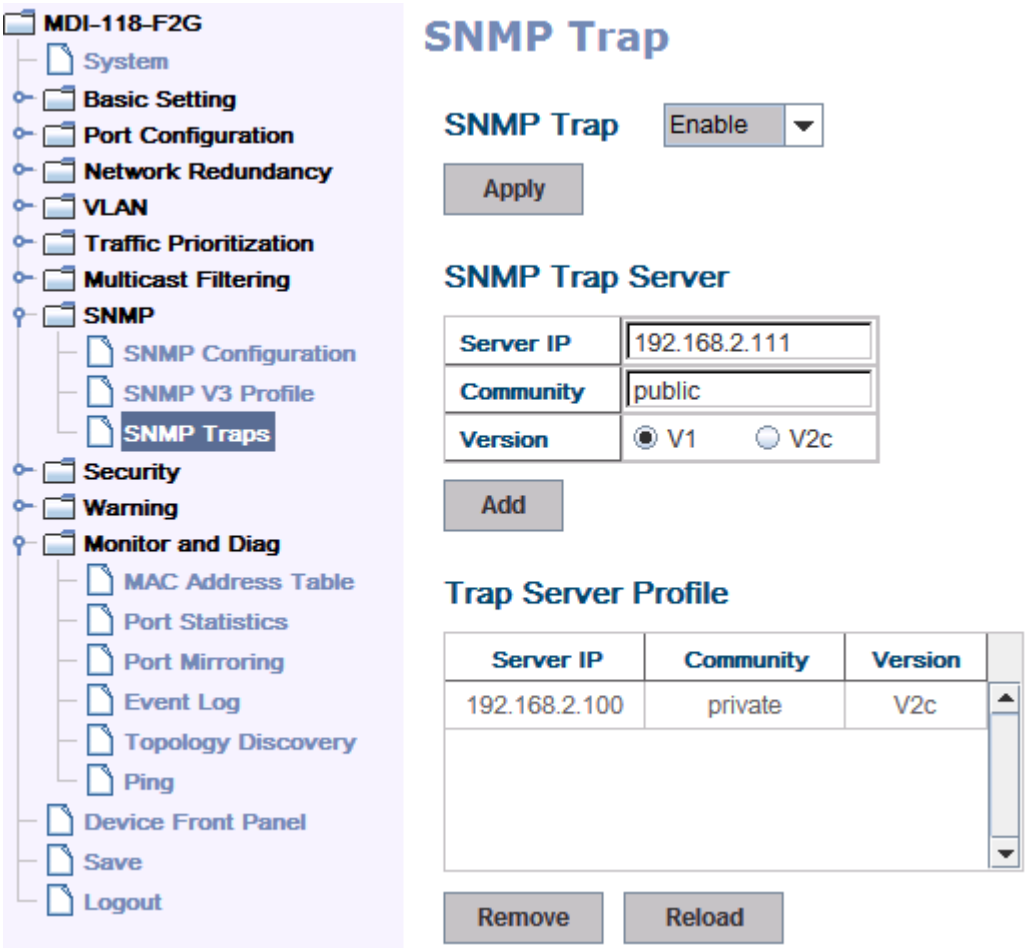
Authentication Password: Here the user enters the SNMP v3 user authentication password.

DES Encryption Password: Here the user enters the password for SNMP v3 user DES Encryption.

4.8.3 SNMP Traps

SNMP Trap is the notification feature defined by SNMP protocol. All the SNMP management applications can understand such trap information. So you don't need to install new application to read the notification information.

This page allows users to **Enable SNMP Trap,** configure the **SNMP Trap server IP**, **Community** name, and trap **Version V1 or V2**. After configuration, you can see the change of the SNMP pre-defined standard traps and Westermo pre-defined traps. The pre-defined traps can be found in Westermo private MIB.



Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.8.4 CLI Commands of the SNMP

Command Lines of the SNMP configuration

Feature	Command Line
SNMP Community	
Read Only Community	Switch(config)# snmp-server community public ro community string add ok
Read Write Community	Switch(config)# snmp-server community private rw community string add ok
SNMP Trap	
Enable Trap	Switch(config)# snmp-server enable trap Set SNMP trap enable ok.
SNMP Trap Server IP without specific community name	Switch(config)# snmp-server host 192.168.2.33 SNMP trap host add OK.
SNMP Trap Server IP with version 1 and community	Switch(config)# snmp-server host 192.168.2.33 version 1 private SNMP trap host add OK. Note: private is the community name, version 1 is the SNMP version
SNMP Trap Server IP with version 2 and community	Switch(config)# snmp-server host 192.168.2.33 version 2 private SNMP trap host add OK.
Disable SNMP Trap	Switch(config)# no snmp-server enable trap Set SNMP trap disable ok.
Display	Switch# sh snmp-server trap SNMP trap: Enabled SNMP trap community: public Switch# show running-config ..... snmp-server community public ro snmp-server community private rw snmp-server enable trap snmp-server host 192.168.2.33 version 2 admin snmp-server host 192.168.2.33 version 1 admin ……

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.9 Security

The switch provides several security features for you to secure your connection. The features include Port Security and IP Security.

Following commands are included in this group:

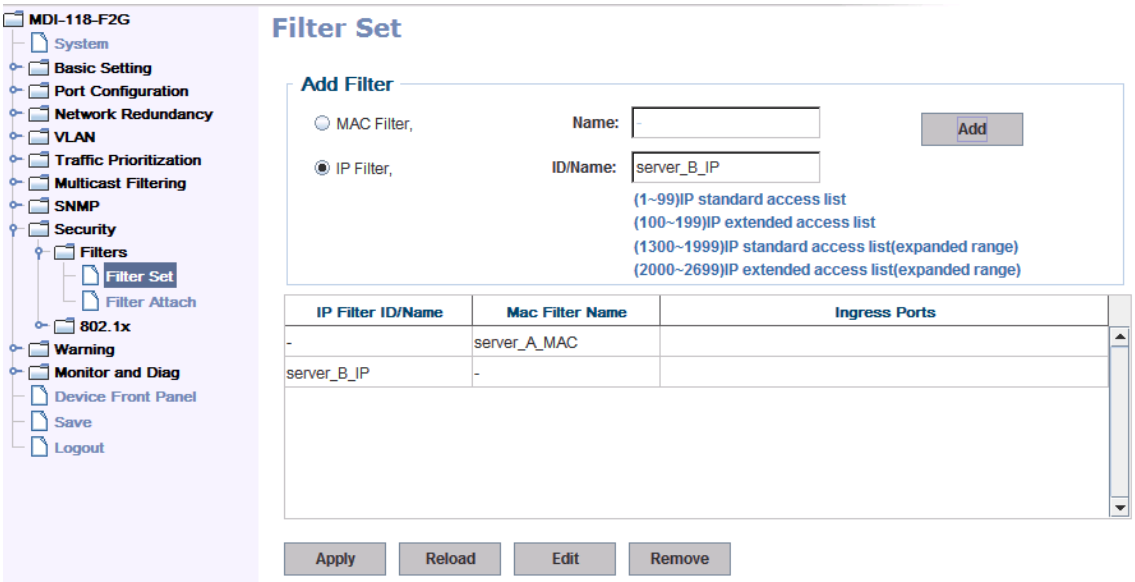
4.9.1 Filter Set (Access Control List)

4.9.2 IEEE 802.1x

4.9.3 CLI Commands of the Security

4.9.1 Filter Set (Access Control List)

The Filter Set is known as Access Control List feature. There are 2 major types, one is MAC Filter, it is also known as Port Security



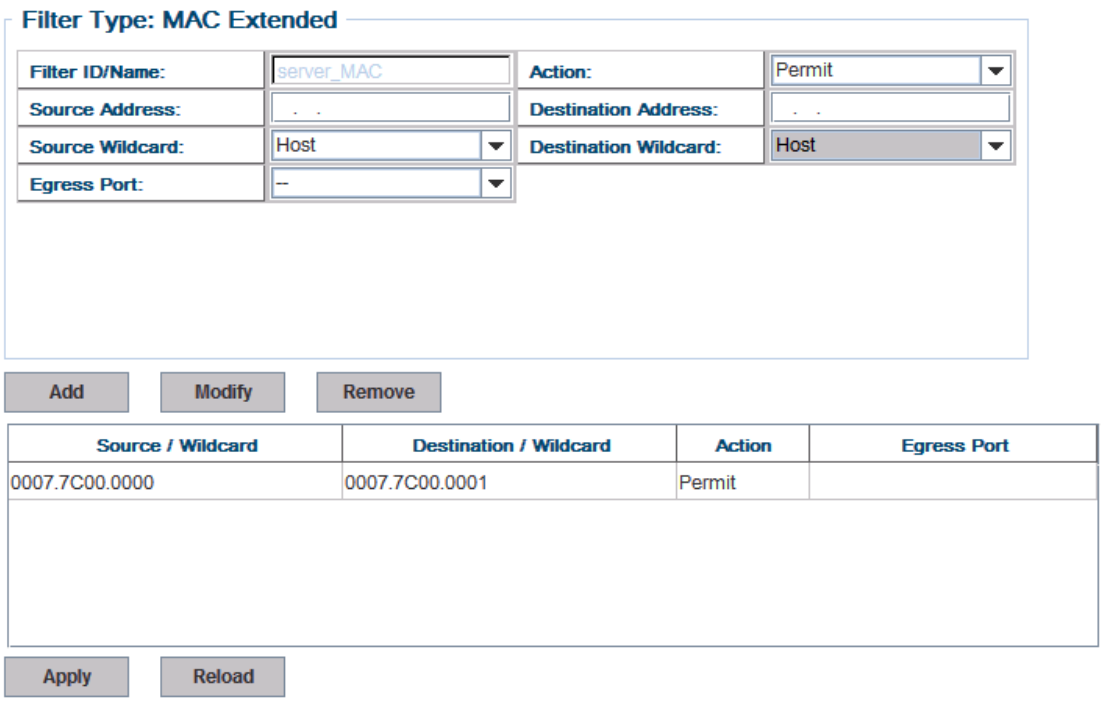
ACE is short of Access Control Entry, user defines the Permit or Deny rule for specific IP/MAC address or IP groups by network mask in each ACE. One ACL may include several ACEs, the system checks the ACEs one after one and forward based on the result. Once the rules conflict, the old entry is selected as the forward rule.

Type the **Name** when select **MAC Filter**, type **ID/Name** when select **IP Filter**. The ID for IP access list is listed as below of the field. Click **Add** to add the rule. Click **Edit** to edit the content for the rule. After configured, click **Apply** to apply all the rules. **Reload** to reload setting. **Remove** to remove one of the entries.

MAC Filter (Port Security):

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Filter Rule



The MAC Filter allows user to define the Access Control List for specific MAC address or a group of MAC addresses.

Filter ID/Name: The name for this MAC Filter entry.

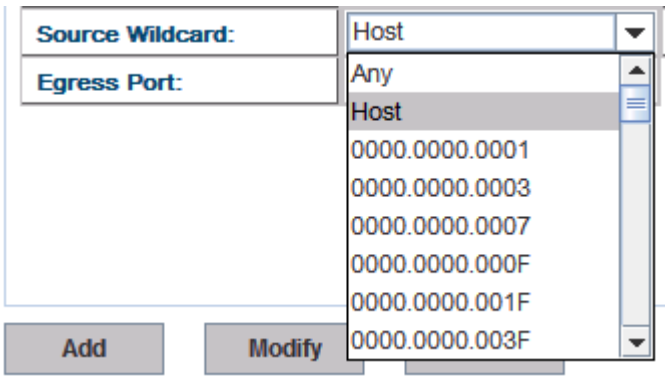
Action: Permit to permit traffic from specified sources. **Deny** to deny traffic from those sources.

Source/Destination Address: Type the MAC address you want configure, the format is "AABB.CCDD.EEFF". Example: "Source to Destination" is "0007.7c00.0000 to 0007.7c00.0001".

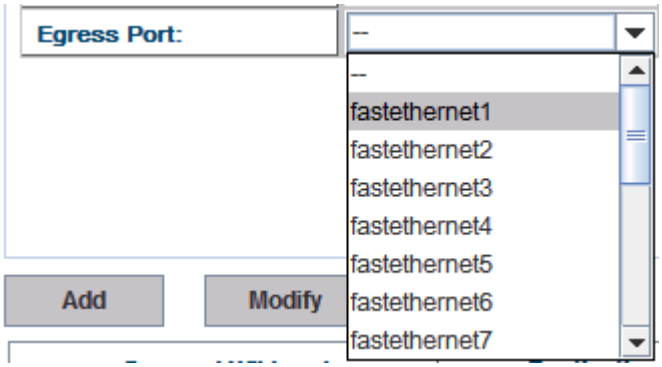
Source/Destination Wildcard: This command allows user to define single host or a group of hosts based on the wildcard. Some of the allowance examples are as below:

Wildcard	Bit	Number of allowance	Note
Any	1111.1111.1111	All	
Host		1	Only the Source or Destination.
0000.0000.0003	0000.0000.000(00000011)	3	
0000.0000.0007	0000.0000.000(00000111)	7	
0000.0000.000F	0000.0000.000(11111111)	15	
….			

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



Egress Port: Bind the MAC Filter rule to specific front port.



Once you finish configuring the ACE settings, click on **Add** to apply your configuration. You can see below screen is shown.

Example of the below Entry:

Permit Source MAC "0007.7c00.0000" to Destination MAC "0007.7c00.0002".

The Permit rule is egress rule and it is bind to Gigabit Ethernet Port 25.

Once you finish configuring the settings, click on **Apply** to apply your configuration.

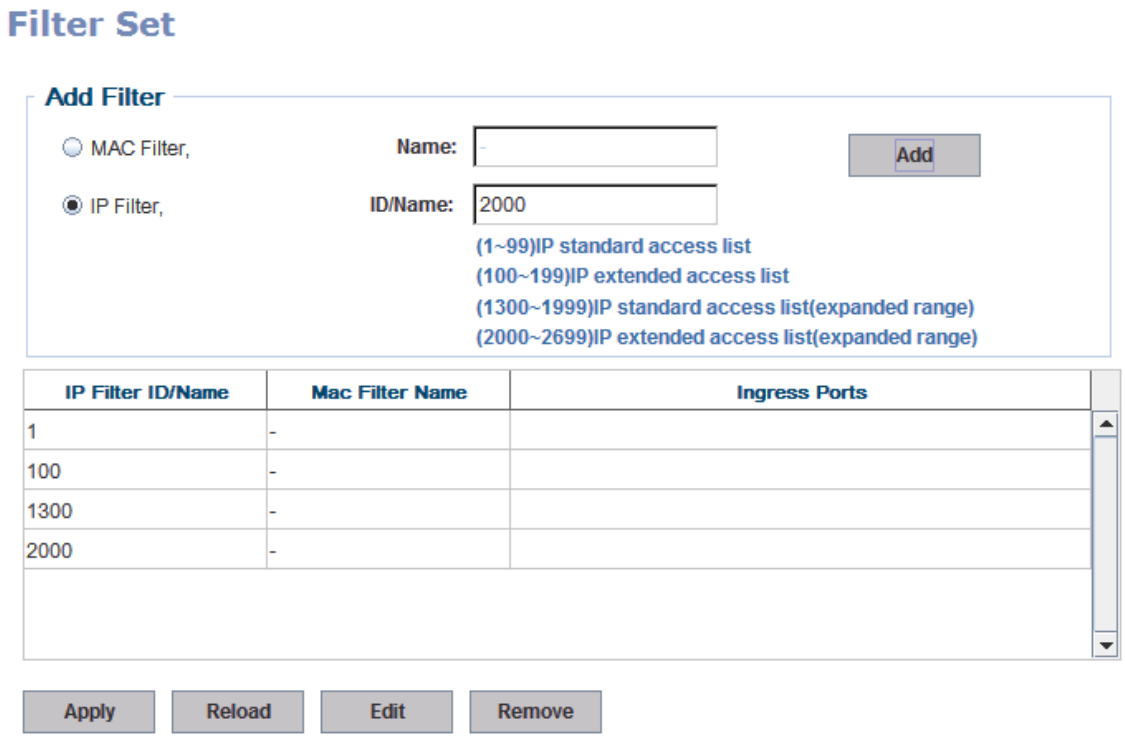
IP Filter:

Type **ID/Name** when select **IP Filter**. The ID for IP access list is listed as below of the field. You can also type ACL name in this field, it goes to IP Extended mode setting and support both IP Standard and IP Extended mode depend on the setting. Click **Add** to add the rule. Click **Edit** to edit the content for the rule. After

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

configured, click **Apply** to apply all the rules. **Reload** to reload setting. **Remove** to remove one of the entries.

Example:



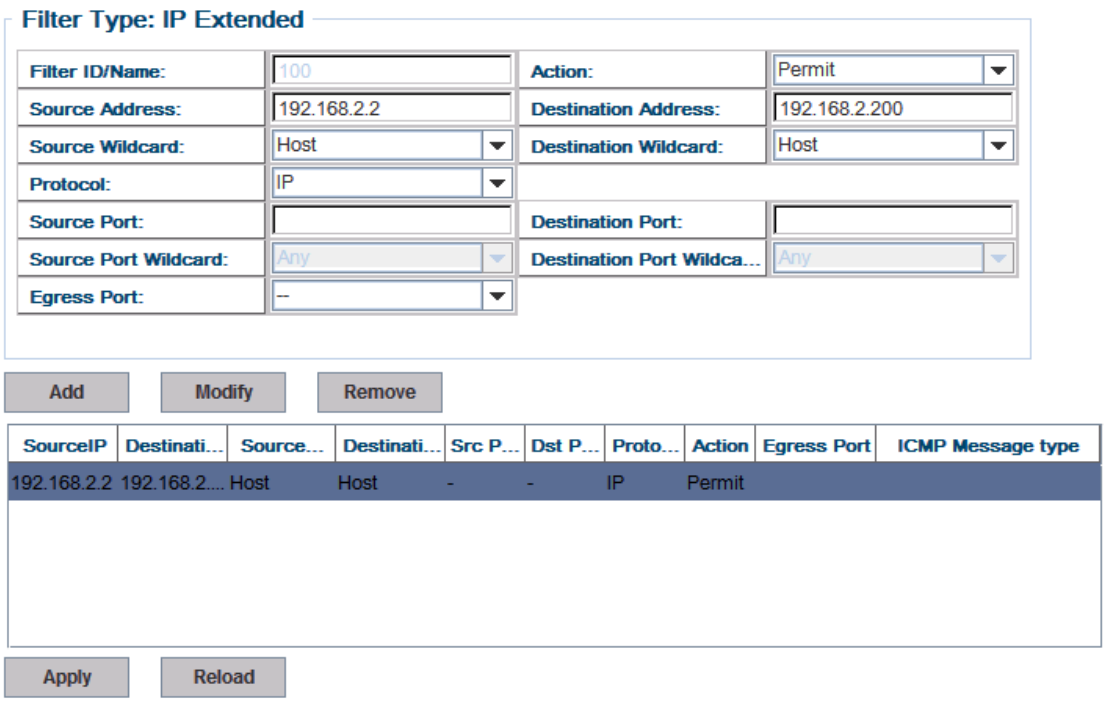
IP Standard Access List: This kind of ACL allows user to define filter rules according to the source IP address.

IP Extended Access List: This kind of ACL allows user to define filter rules according to the source IP address, destination IP address, Source TCP/UDP port, destination TCP/UDP port and ICMP type and code.

Click **Edit** to configure the IP Filter Rules.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

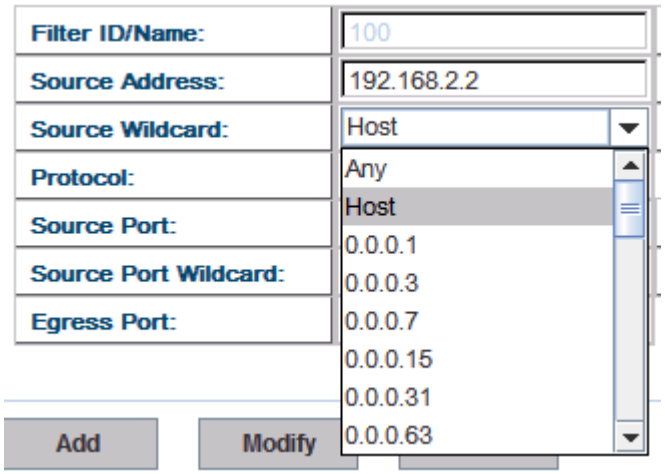
Filter Rule



Filter ID/Name: The ID or the name for this IP Filter entry.

Action: Permit to permit traffic from specified sources. **Deny** to deny traffic from those sources.

Source/Destination Address: Type the source/destination IP address you want configure.



Source/Destination Wildcard: This command allows user to define single host or a group of hosts based on the wildcard. Some of the allowance examples are as below:

Wildcard	Bit	Number	Note

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

		of allowance	
Any	11111111.11111111. 11111111.11111111	All	All IP addresses. Or a mask: 255.255.255.255
Host	0.0.0.0	1	Only the Source or Destination host.
0.0.0.3	0.0.0.(00000011)	3	
0.0.0.7	0.0.0.(00000111)	7	
0.0.0.15	0.0.0.(11111111)	15	
….			

Note: The mask is a wildcard mask: the high-order bits of the mask that are binary zeros determine how many corresponding high-order bits in the IP address are significant. The selected action applies to any source address with these high-order bits.

Protocol: Select a protocol you want associate with the filter. The field includes IP, TCP, UDP or ICMP type.

Destination Port: TCP/UDP port of the Destination Port field.

ICMP Type: The ICMP Protocol Type range from 1 ~ 255.

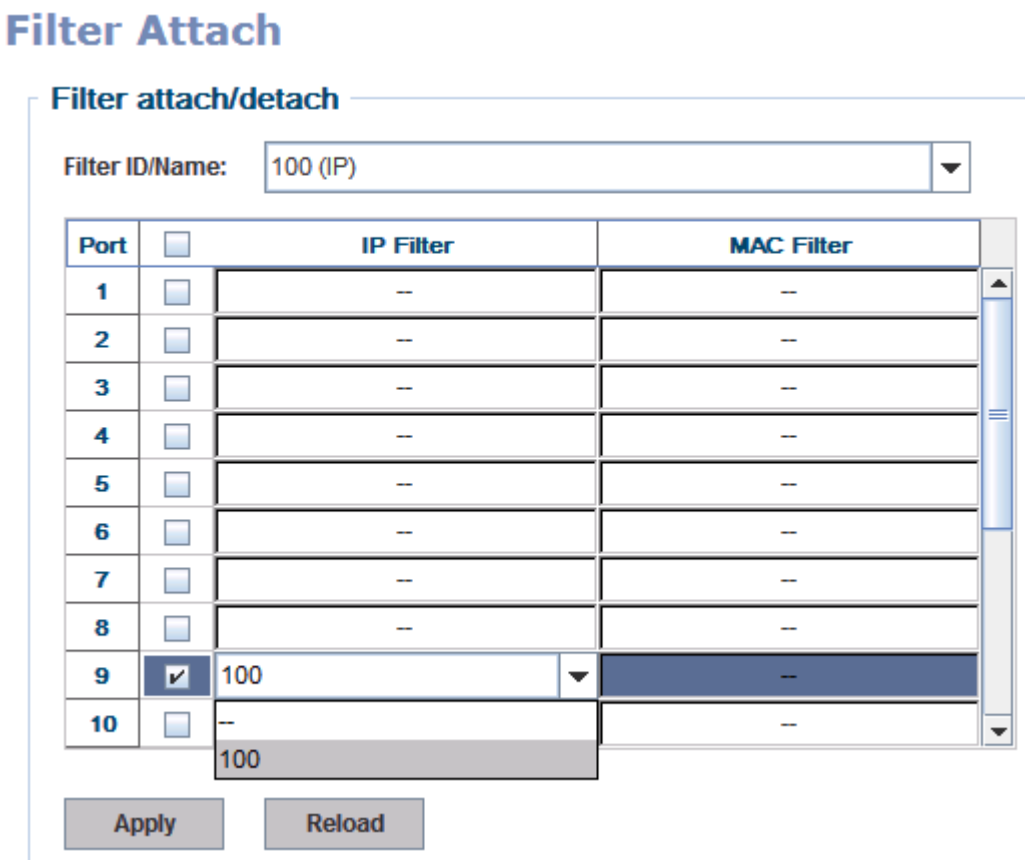
ICMP Code: The ICMP Protocol Code range from 1 ~ 255.

Egress Port: Bind this Filter to selected egress port.

Click the **Add** button to add the rule to the Filter. Click the **Remove** button to remove the selected rule from Filter. Click the **Modify** button to edit the rule which you selected. Click the **Reload** button to reload the rule table.

Click the **Apply** button to apply the Filter configurations.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



Filter Attach (Access Control List)

After configured the ACL filter rules, remember associate this filter with the physical ports. Then the port has the capability to filter traffic/attach based on the packets lost.

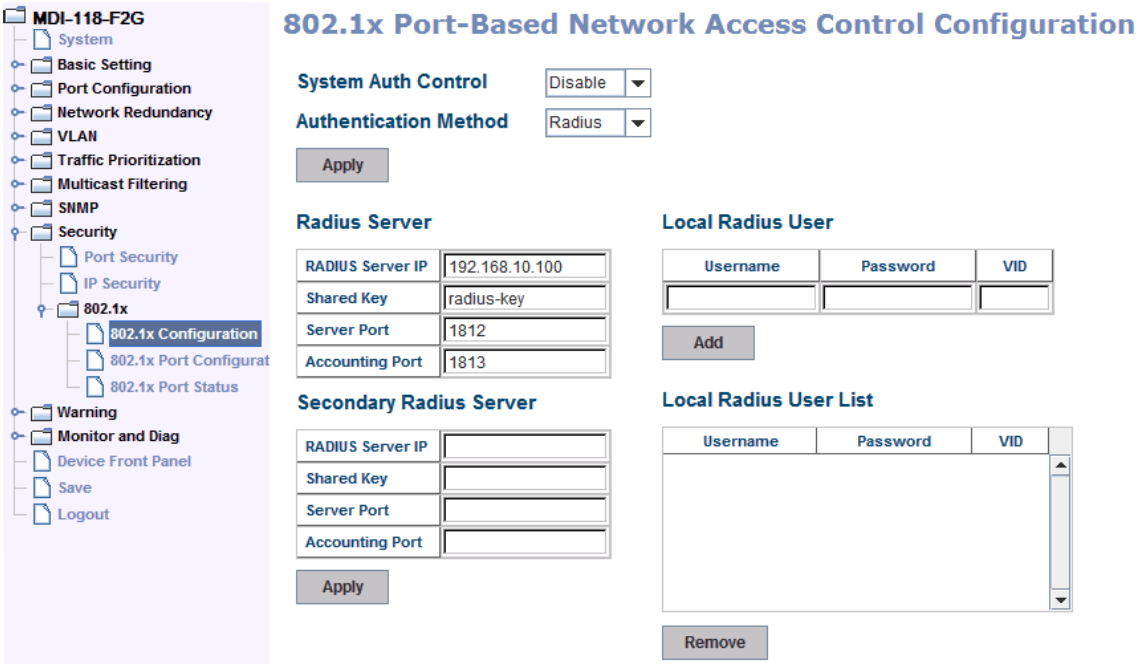
Note: Different model may support different access control capability, the above commands are applied to generic managed switch. But, due to the hardware restriction, some of the above command may not support in your product. Please check the web and CLI of your product.

4.9.2 IEEE 802.1x

802.1X configuration

IEEE 802.1X is the protocol that performing authentication to obtain access to IEEE 802 LANs. It is port-base network access control. With the function, The switch could control which connection is available or not.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



System AuthControl: To enable or disable the 802.1x authentication.

Authentication Method: Radius is a authentication server that provide key for authentication, with this method, user must connect switch to server. If user select Local for the authentication method, switch use the local user data base which can be create in this page for authentication.

Radius Server IP: The IP address of Radius server

Shared Key: The password between switch and Radius Server.

Server Port: UDP port of Radius server.

Accounting Port: Port for packets that contain the information of account login or logout.

Secondary Radius Server IP: Secondary Radius Server could be set in case of the primary radius server down.

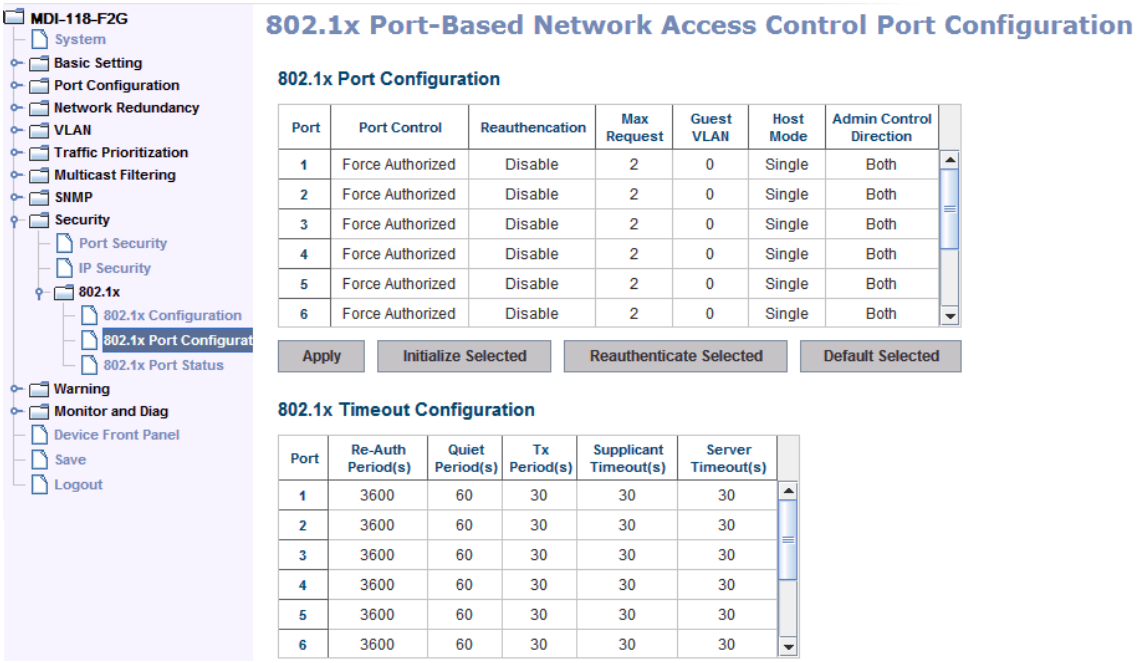
802.1X Local User: Here User can add Account/Password for local authentication.

802.1X Local user List: This is a list shows the account information, User also can remove selected account.

802.1x Port Configuration

After the configuration of Radius Server or Local user list, user also need configure the authentication mode, authentication behavior, applied VLAN for each port and permitted communication. The following information will explain the port configuration.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



Port control: Force Authorized means this port is authorized; the data is free to in/out. Force unauthorized just opposite, the port is blocked. If users want to control this port with Radius Server, please select Auto for port control.

Reauthentication: If enable this field, switch will ask client to re-authenticate. The default time interval is 3600 seconds.

Max Request: the maximum times that the switch allow client request.

Guest VLAN: 0 to 4094 is available for this field. If this field is set to 0, that means the port is blocked after authentication fail. Otherwise, the port will be set to Guest VLAN.

Host Mode: if there are more than one device connected to this port, set the Host Mode to single means only the first PC authenticate success can access this port. If this port is set to multi, all the device can access this port once any one of them pass the authentication.

Control Direction: determined devices can end data out only or both send and receive.

Re-Auth Period: control the Re-authentication time interval, 1~65535 is available.

Quiet Period: When authentication failed, Switch will wait for a period and try to communicate with radius server again.

Tx period: the time interval of authentication request.

Supplicant Timeout: the timeout for the client authenticating

Sever Timeout: The timeout for server response for authenticating.

Once you finish configuring the settings, click on **Apply** to apply your configuration.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

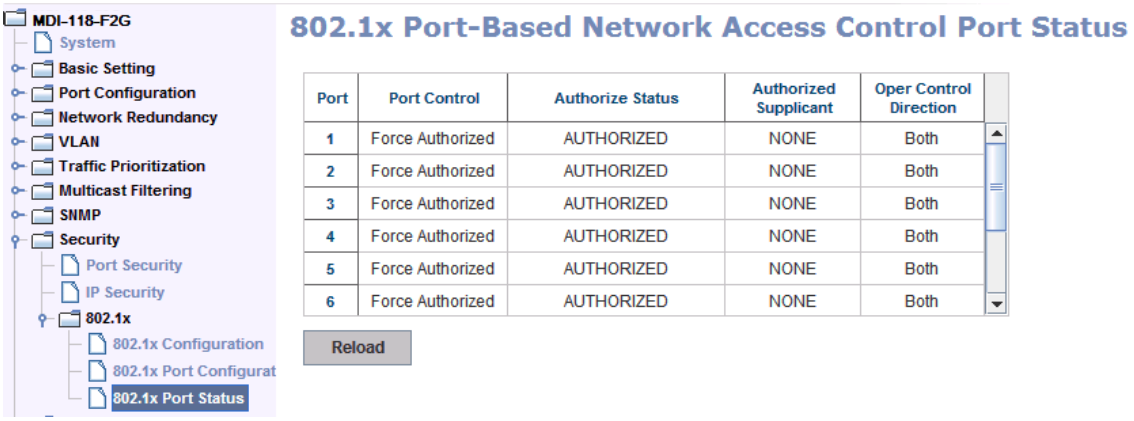
Click **Initialize Selected** to set the authorize state of selected port to initialize status.

Click **Reauthenticate Selected** to send EAP Request to supplicant to request reauthentication.

Click **Default Selected** to reset the configurable 802.1x parameters of selected port to the default values.

802.1X Port Status

Here user can observe the port status for Port control status, Authorize Status, Authorized Supplicant and Oper Control Direction each port.



4.9.3 CLI Commands of the Security

Command Lines of the Security configuration

Feature	Command Line
Port Security	
Add MAC access list	Switch(config)# mac access-list extended NAME access-list name Switch(config)# mac access-list extended server1 Switch(config-ext-macl)# permit Specify packets to forward deny Specify packets to reject end End current mode and change to enable mode exit Exit current mode and down to previous mode list Print command list no Negate a command or set its defaults

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	quit Exit current mode and down to previous mode
Add IP Standard access list	Switch(config)# ip access-list extended Extended access-list standard Standard access-list Switch(config)# ip access-list standard <1-99> Standard IP access-list number <1300-1999> Standard IP access-list number (expanded range) WORD Access-list name Switch(config)# ip access-list standard 1 Switch(config-std-acl)# deny Specify packets to reject permit Specify packets to forward end End current mode and change to enable mode exit Exit current mode and down to previous mode list Print command list no Negate a command or set its defaults quit Exit current mode and down to previous mode remark Access list entry comment
Add IP Extended access list	Switch(config)# ip access-list extended <100-199> Extended IP access-list number <2000-2699> Extended IP access-list number (expanded range) WORD access-list name Switch(config)# ip access-list extended 100 Switch(config-ext-acl)# deny Specify packets to reject permit Specify packets to forward end End current mode and down to previous mode exit Exit current mode and down to previous mode list Print command list no Negate a command or set its defaults

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	quit Exit current mode and down to previous mode remark Access list entry comment
Example 1: Edit MAC access list	Switch(config-ext-macl)#permit MACADDR Source MAC address xxxx.xxxx.xxxx any any source MAC address host A single source host Switch(config-ext-macl)#permit host MACADDR Source MAC address xxxx.xxxx.xxxx Switch(config-ext-macl)#permit host 0007.7c11.2233 MACADDR Destination MAC address xxxx.xxxx.xxxx any any destination MAC address host A single destination host Switch(config-ext-macl)#permit host 0012.7711.2233 host MACADDR Destination MAC address xxxx.xxxx.xxxx Switch(config-ext-macl)#permit host 0012.7711.2233 host 0011.7711.2234 [IFNAME] Egress interface name Switch(config-ext-macl)#permit host 0007.7c11.2233 host 0011.7711.2234 gi25 *Note: MAC Rule: Permit/Deny wildcard Source_MAC wildcard Dest_MAC Egress_Interface*
Example 1: Edit IP Extended access list	Switch(config)# ip access-list extended 100 Switch(config-ext-acl)#permit ip Any Internet Protocol tcp Transmission Control Protocol udp User Datagram Protocol icmp Internet Control Message Protocol Switch(config-ext-acl)#permit ip A.B.C.D Source address any Any source host host A single source host Switch(config-ext-acl)#permit ip

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	192.168.20.200 A.B.C.D Source wildcard bits Switch(config-ext-acl)#permit ip 192.168.20.200 0.0.0.1 A.B.C.D Destination address any Any destination host host A single destination host Switch(config-ext-acl)#permit ip 192.168.20.200 0.0.0.1 192.168.2.201 0.0.0.1 [IFNAME] Egress interface name Switch(config-ext-acl)#permit ip 192.168.20.200 0.0.0.1 192.168.2.201 0.0.0.1 gi17 *Note: Follow the below rule to configure ip extended access list.* *IP Rule: Permit/Deny Source_IP wildcard Dest_IP wildcard Egress_Interface* *TCP Rule: Permit/Deny tcp Source_IP wildcard Dest_IP wildcard eq Given_Port_Number Egress_Interface* *UDP Rule: Permit/Deny udp Source_IP wildcard Dest_IP wildcard eq Given_Port_Number Egress_Interface* *ICMP Rule: Permit/Deny icmp Source_IP wildcard Dest_IP wildcard ICMP_Message_Type ICMP_Message_Code Egress_Interface*
Add MAC	Switch(config)# mac-address-table static 0007.7c01.0101 vlan 1 interface fa1 mac-address-table unicast static set ok!
Port Security	Switch(config)# interface fa1 Switch(config-if)# switchport port-security Disables new MAC addresses learning and aging activities! *Note 1: Rule: Add the static MAC, VLAN and Port binding first, then enable the port security to*

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	stop new MAC learning. *Note 2: Not all the model support this feature, check the product detail specification.*
Disable Port Security	Switch(config-if)# no switchport port-security Enable new MAC addresses learning and aging activities!
Display	Switch# show mac-address-table static Destination Address Address Type Vlan Destination Port ------------------ -------------- ------- ---------- 0007.7c01.0101 Static 1 fa1
802.1x	
Enable Disable	Switch(config)# dot1x system-auth-control The Port-Based Network Acess Control is globally enabled Switch(config)# no dot1x system-auth-control The Port-Based Network Acess Control is globally disabled
authentic-method	Switch(config)# dot1x authentic-method local Use the local username database for authentication radius Use the Remote Authentication Dial-In User Service (RADIUS) servers for authentication Switch(config)# dot1x authentic-method radius Switch(config)#
radius server-ip	Switch(config)# dot1x radius Switch(config)# dot1x radius server-ip 192.168.20.200 key 1234 RADIUS Server Port number NOT given. (default=1812) RADIUS Accounting Port number NOT given. (default=1813) RADIUS Server IP : 192.168.20.200

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	RADIUS Server Key : 1234 RADIUS Server Port : 1812 RADIUS Accounting Port : 1813 Switch(config)#
radius secondary-server-ip	Switch(config)# dot1x radius secondary-server-ip 192.168.10.250 key 5678 Port number NOT given. (default=1812) RADIUS Accounting Port number NOT given. (default=1813) Secondary RADIUS Server IP : 192.168.10.250 Secondary RADIUS Server Key : 5678 Secondary RADIUS Server Port : 1812 Secondary RADIUS Accounting Port : 1813
User name/password for authentication	Switch(config)# dot1x username passwd vlan 1

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.10 Warning

The switch provides several types of Warning features for you to remote monitor the status of end devices or the change of your network. The features include Fault Relay, System Log and SMTP E-mail Alert.

Following commands are included in this group:

4.10.1 Fault Relay

4.10.2 Event Selection

4.10.3 Syslog Configuration

4.10.4 SMTP Configuration

4.10.5 CLI Commands

4.10.1 Fault Relay

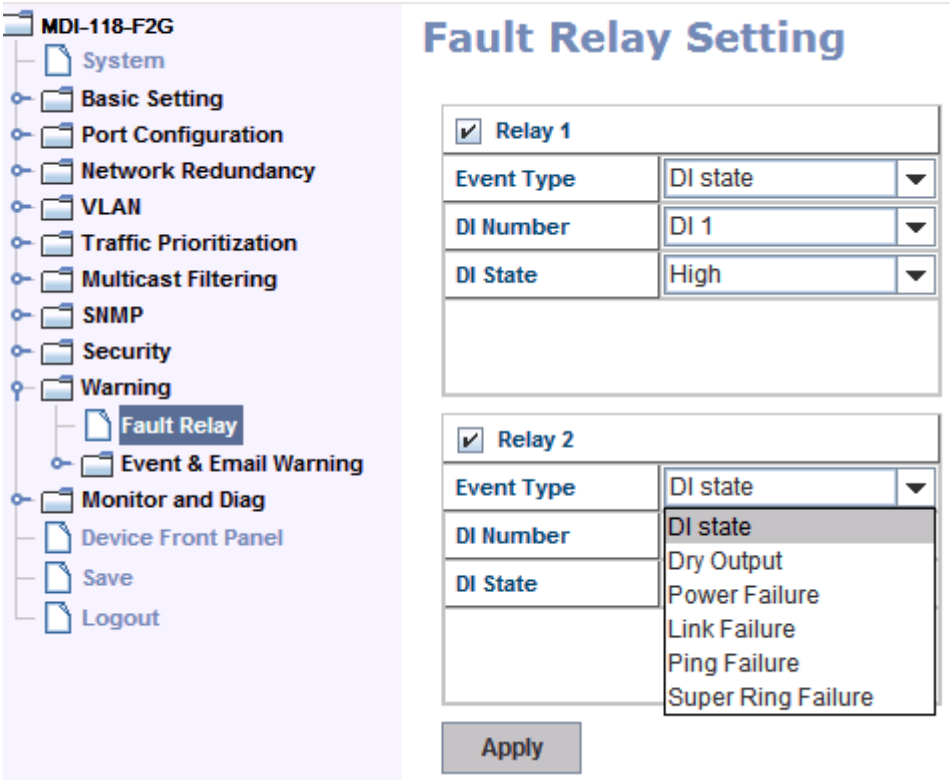
The switch provides 2 digital outputs, also known as Relay Output. The relay contacts are energized (open) for normal operation and will close under fault conditions. Fault conditions include DI State change, Periodical On/Off, Power Failure, Ethernet port Link Failure, Ping Failure and Super Ring Topology Change. You can configure these settings in this Fault Relay Setting. Each Relay can be assigned 1 fault condition.

Relay 1: Click on checkbox of the Relay 1, then select the Event Type and its parameters.

Relay 2: Click on checkbox of the Relay 2, then select the Event Type and its parameters.

Event Type: Dry Output, Power Failure, Link Failure, Ping Failure and Super Ring Failure. Each event type has its own parameters. You should also configure them. Currently, each Relay can have one event type.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



Event Type: **Dry Output**

On Period (Sec): Type the period time to turn on Relay Output. Available range of a period is 0-4294967295 seconds.

Off Period (Sec): Type the period time to turn off Relay Output. Available range of a period is 0-4294967295 seconds.

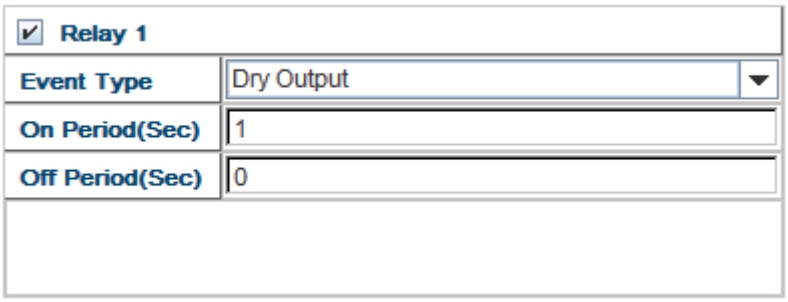
How to configure: Type turn-on period and turn-off period when the time is reached, the system will turn on or off the Relay Output. If you connect DO to DI of the other terminal unit, the setting can help you to change DI state. If you connect DO to the power set of other terminal units, this setting can help you to turn on or off the unit.

How to turn On/Off the other device: Type “1” into the “On period” field and “0” into “Off Period” field and apply the setting, then it t will be trigger to form as a close circuit.

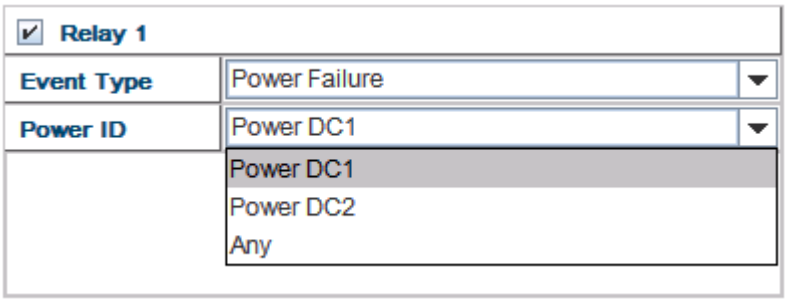
To turn off the relay, just type “0” into the “On period” field and “1” into “Off Period” field and apply the setting, the relay will be trigger to form as a open circuit.

This function is also available in CLI, SNMP management interface. See the following setting.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



Turn on the relay output



Turn off the relay output

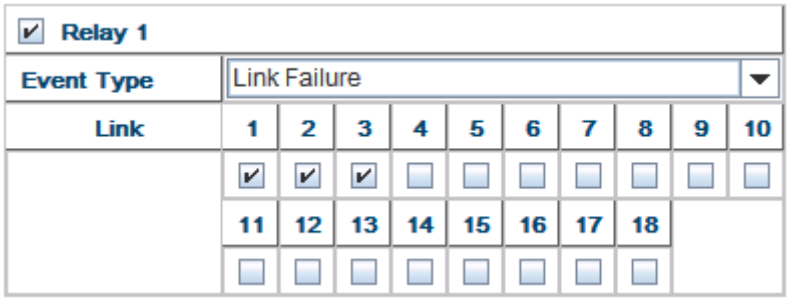
Event Type: **Power Failure**

Power ID: Select Power 1 or Power 2 you want to monitor. When the power is shut down or broken, the system will short Relay Out and light the DO LED.

Event Type: **Like Failure**

Link: Select the port ID you want to monitor.

How to configure: Select the checkbox of the Ethernet ports you want to monitor. You can select one or multiple ports. When the selected ports are linked down or broken, the system will short Relay Output and light the DO LED.

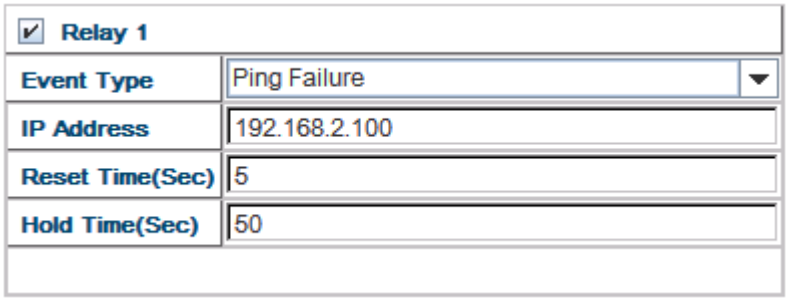


Event Type: **Ping Failure**

IP Address: IP address of the target device you want to ping.

Reset Time (Sec): Waiting time to short the relay output.

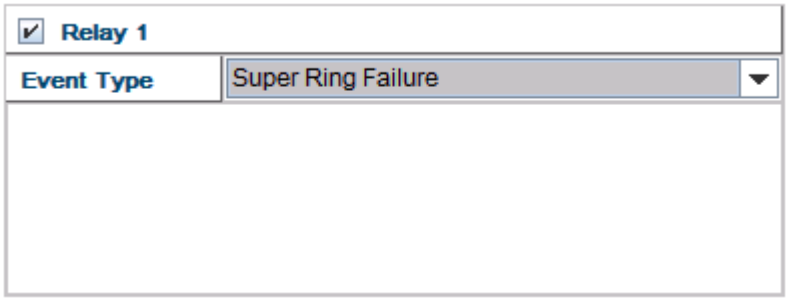
Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



Hold Time (Sec): Waiting time to ping the target device for the duration of remote device boot

How to configure: After selecting Ping Failure event type, the system will turn Relay Output to short state and continuously ping the target device. When the ping failure occurred, the switch will turn the Relay Output to open state for a period of Reset Time.
After the Reset Time timeout, the system will turn the Relay Output to close state. After the Hold Time timer is timeout, the switch system will start ping the target device.
Ex: Reset Time is 5 sec, Hold Time is 50 sec.
If the ping failure occurred, the switch system will turn Relay output to open state to emulate power switch off for 5 sec periods. After Reset Time timeout, the Switch system will start ping target device after 50 sec periods. The period time is for target device system booting. During the period, the switch system will not ping target device until Hold Time is timeout.

Event Type: **Super Ring Failure**
Select Super Ring Failure. When the Rapid Super Ring topology is changed, the system will short Relay Out and lengthen DO LED.



Once you finish configuring the settings, click on **Apply** to apply your configuration.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.10.2 Event Selection

Event Types can be divided into two basic groups: System Events and Port Events. System Events are related to the overall function of the switch, whereas Port Events related to the activity of the specific ports

System Event	Warning Event is sent when…..
Authentication Failure	An incorrect password, SNMP Community String is entered.
Time Synchronize Failure	Accessing to NTP Server is failure.
Power 1 Failure	Selected Power ID is failure.
Power 2 Failure	Selected Power ID is failure.
Fault Relay	The DO/Fault Relay is on.
Super Ring Topology Changes	Master of Super Ring has changed or backup path is activated.
Port Event	**Warning Event is sent when…..**
Link-Up	The port is connected to another device
Link-Down	The port is disconnected (e.g. the cable is pulled out, or the opposing devices turns down)
Both	Either of Link Up or Link Down

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Once you finish configuring the settings, click on **Apply** to apply your configuration.

4.10.3 SysLog Configuration

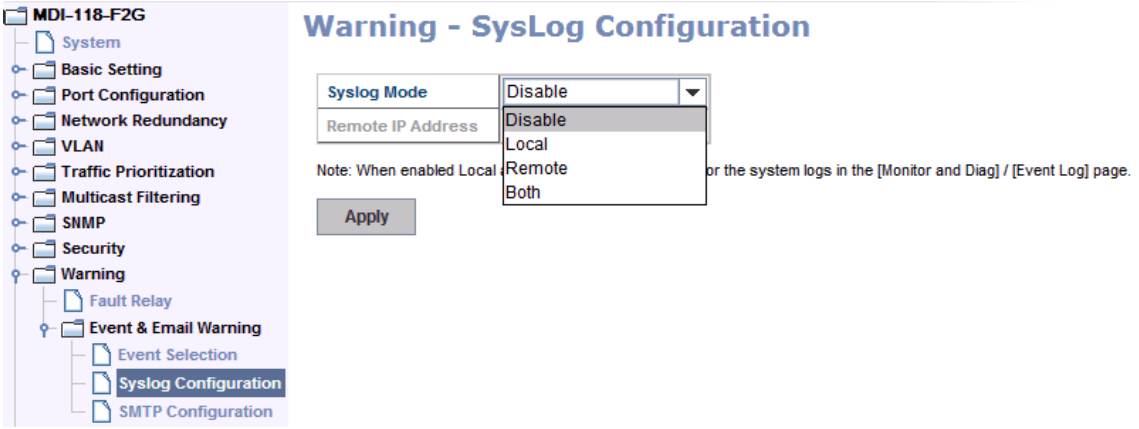
System Log is useful to provide system administrator locally or remotely monitor switch events history. There are 2 System Log modes provided by the switch, local mode and remote mode.

Local Mode: In this mode, The switch will print the occurred events selected in the Event Selection page to System Log table of The switch. You can monitor the system logs in [Monitor and Diag] / [Event Log] page.

Remote Mode: The remote mode is also known as Server mode. In this mode, you should assign the IP address of the System Log server. The switch will send the occurred events selected in Event Selection page to System Log server you assigned.

Both: Above 2 modes can be enabled at the same time.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



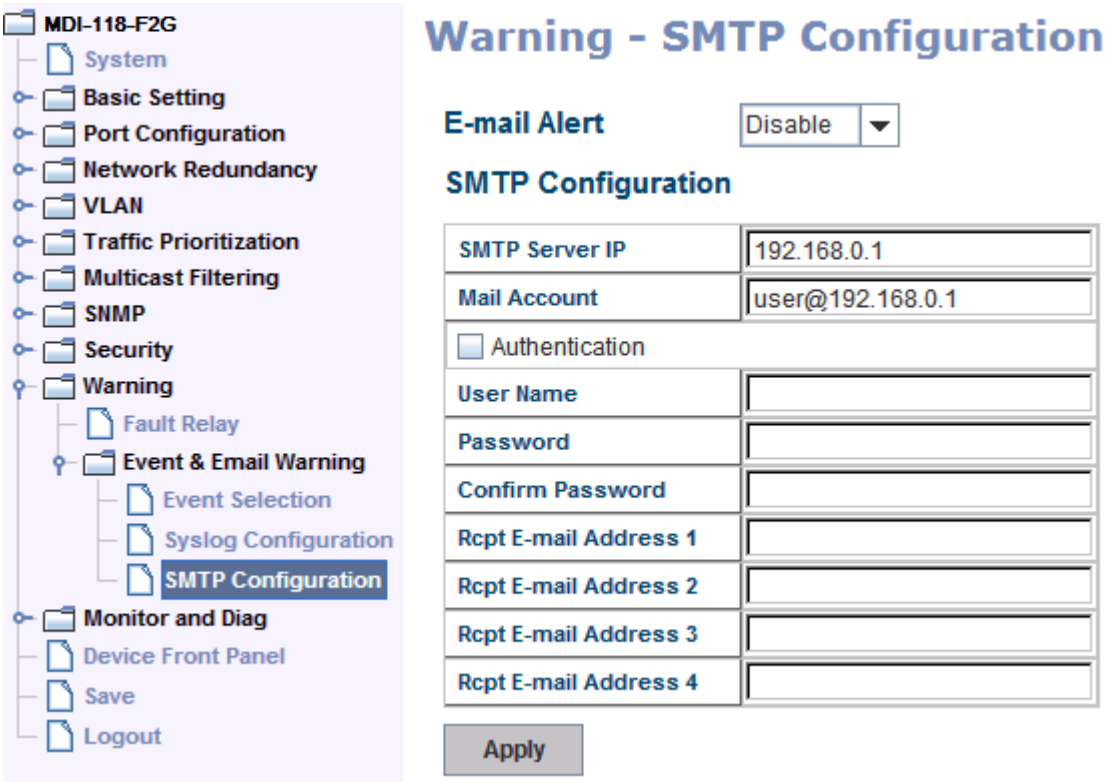
Once you finish configuring the settings, click on **Apply** to apply your configuration.

Note: When enabling Local or Both mode, you can monitor the system logs in [Monitor and Diag] / [Event Log] page.

4.10.4 SMTP Configuration

The switch supports E-mail Warning feature. The switch will send the occurred events to remote E-mail server. The receiver can then receive notification by E-mail. The E-mail warning is conformed to SMTP standard.

This page allows you to enable E-mail Alert, assign the SMTP Server IP, Sender E-mail, and Receiver E-mail. If SMTP server requests you to authorize first, you can also set up the username and password in this page.



Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Field	Description
SMTP Server IP Address	Enter the IP address of the email Server
Authentication	Click on check box to enable password
User Name	Enter email Account name (Max.40 characters)
Password	Enter the password of the email account
Confirm Password	Re-type the password of the email account
You can set up to 4 email addresses to receive email alarm	
Rcpt E-mail Address 1	The first email address to receive email alert from the switch (Max. 40 characters)
Rcpt E-mail Address 2	The second email address to receive email alert from the switch (Max. 40 characters)
Rcpt E-mail Address 3	The third email address to receive email alert from the switch (Max. 40 characters)
Rcpt E-mail Address 4	The fourth email address to receive email alert from the switch (Max. 40 characters)

Once you finish configuring the settings, click on **Apply** to apply your configuration.

4.10.5 CLI Commands

Command Lines of the Warning configuration

Feature	Command Line
Relay Output	
Relay Output	Switch(config)# relay 1 dry dry output ping ping failure port port link failure power power failure ring super ring failure ***Note: Select Relay 1 or 2 first, then select the event types.***
Dry Output	Switch(config)# relay 1 dry <0-4294967295> turn on period in second Switch(config)# relay 1 dry 5 <0-4294967295> turn off period in second

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	Switch(config)# relay 1 dry 5 5
Ping Failure	Switch(config)# relay 1 ping 192.168.10.33 <cr> reset reset a device Switch(config)# relay 1 ping 192.168.10.33 reset <1-65535> reset time Switch(config)# relay 1 ping 192.168.10.33 reset 60 <0-65535> hold time to retry Switch(config)# relay 1 ping 192.168.10.33 reset 60 60
Port Link Failure	Switch(config)# relay 1 port PORTLIST port list Switch(config)# relay 1 port fa1-5
Power Failure	Switch(config)# relay 1 power <1-2> power id any Anyone power failure asserts relay Switch(config)# relay 1 power 1
Super Ring Failure	Switch(config)# relay 1 ring
Disable Relay	Switch(config)# no relay <1-2> relay id Switch(config)# no relay 1 *(Relay_ID: 1 or 2)* <cr>
Display	Switch# show relay 1 Relay Output Type : Port Link Port : 1, 2, 3, 4, Switch# show relay 2 Relay Output Type : Super Ring
Event Selection	
Event Selection	Switch(config)# warning-event coldstart Switch cold start event warmstart Switch warm start event linkdown Switch link down event linkup Switch link up event authentication Authentication failure event fault-relay Switch fault relay event power Switch power failure event super-ring Switch super ring topology

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	change event time-sync Switch time synchronize event
Ex: Cold Start event	Switch(config)# warning-event coldstart Set cold start event enable ok.
Ex: Link Up event	Switch(config)# warning-event linkup [IFLIST] Interface list, ex: fa1,fa3-5,gi17-18 Switch(config)# warning-event linkup fa5 Set fa5 link up event enable ok.
Display	Switch# show warning-event Warning Event: Cold Start: Enabled Warm Start: Disabled Authentication Failure: Disabled Link Down: fa4-5 Link Up: fa4-5 Power Failure: Super Ring Topology Change: Disabled Fault Relay: Disabled Time synchronize Failure: Disable
Syslog Configuration	
Local Mode	Switch(config)# log syslog local
Server Mode	Switch(config)# log syslog remote 192.168.10.33
Both	Switch(config)# log syslog local Switch(config)# log syslog remote 192.168.10.33
Disable	Switch(config)# no log syslog local
SMTP Configuration	
SMTP Enable	Switch(config)# smtp-server enable email-alert SMTP Email Alert set enable ok.
Sender mail	Switch(config)# smtp-server server 192.168.20.200 ACCOUNT SMTP server mail account, ex: admin@.com Switch(config)# smtp-server server 192.168.20.200 admin@.com SMTP Email Alert set Server: 192.168.20.200, Account: admin@.com ok.
Receiver mail	Switch(config)# smtp-server receipt 1

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	support@westermo.se SMTP Email Alert set receipt 1: support@westermo.se ok.
Authentication with username and password	Switch(config)# smtp-server authentication username admin password admin SMTP Email Alert set authentication Username: admin, Password: admin ***Note: You can assign string to username and password.***
Disable SMTP	Switch(config)# no smtp-server enable email-alert SMTP Email Alert set disable ok.
Disable Authentication	Switch(config)# no smtp-server authentication SMTP Email Alert set Authentication disable ok.
Dispaly	Switch# sh smtp-server SMTP Email Alert is Enabled Server: 192.168.20.200, Account: support@westermo.se Authentication: Enabled Username: admin, Password: admin SMTP Email Alert Receipt: Receipt 1: support@westermo.se Receipt 2: Receipt 3: Receipt 4:

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.11 Monitor and Diag

The switch provides several types of features for you to monitor the status of the switch or diagnostic for you to check the problem when encountering problems related to the switch. The features include MAC Address Table, Port Statistics, Port Mirror, Event Log and Ping.

Following commands are included in this group:

4.11.1 MAC Address Table

4.11.2 Port Statistics

4.11.3 Port Mirror

4.11.4 Event Log

4.11.5 Topology Discovery

4.11.5 Ping

4.11.6 CLI Commands of the Monitor and Diag

4.11.1 MAC Address Table

The switch provides 8K entries in MAC Address Table. In this page, users can change the Aging time, add Static Unicast MAC Address, monitor the MAC address or sort them by different packet types and ports. Click on **Apply** to change the value.

Aging Time (Sec)

Each switch fabric has limit size to write the learnt MAC address. To save more entries for new MAC address, the switch fabric will age out non-used MAC address entry per Aging Time timeout. The default Aging Time is 300 seconds. The Aging Time can be modified in this page.

Static Unicast MAC Address

In some applications, users may need to type in the static Unicast MAC address to its MAC address table. In this page, you can type MAC Address (format: xxxx.xxxx.xxxx), select its VID and Port ID, and then click on **Add** to add it to MAC Address table.

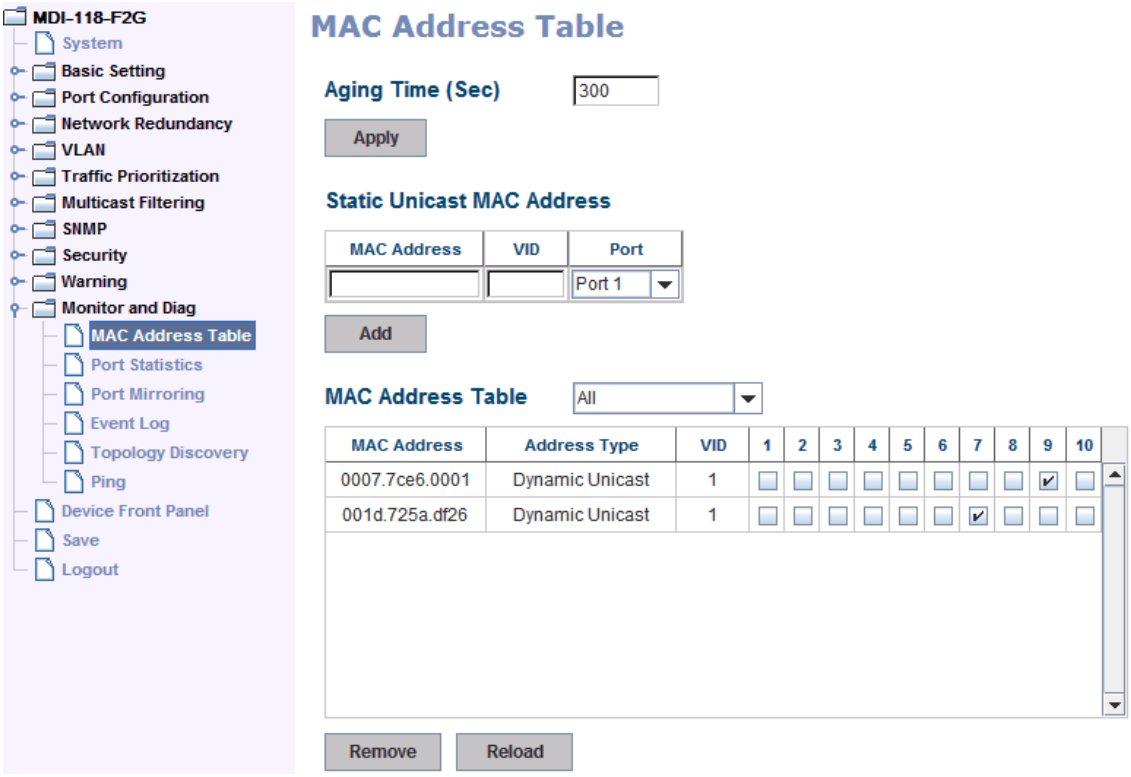
MAC Address Table

In this MAC Address Table, you can see all the MAC Addresses learnt by the switch fabric. The packet types include Management Unicast, Static Unicast, Dynamic Unicast, Static Multicast and Dynamic Multicast. The table allows users to sort the address by the packet types and port.

Packet Types: Management Unicast means MAC address of the switch. It belongs to CPU port only. **Static Unicast** MAC address can be added and deleted. **Dynamic Unicast** MAC is MAC address learnt by the switch Fabric. **Static**

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Multicast can be added by CLI and can be deleted by Web and CLI. **Dynamic Multicast** will appear after you enabled IGMP and the switch learnt IGMP report. Click on **Remove** to remove the static Unicast/Multicast MAC address. Click on **Reload** to refresh the table. New learnt Unicast/Multicast MAC address will be updated to MAC address table.



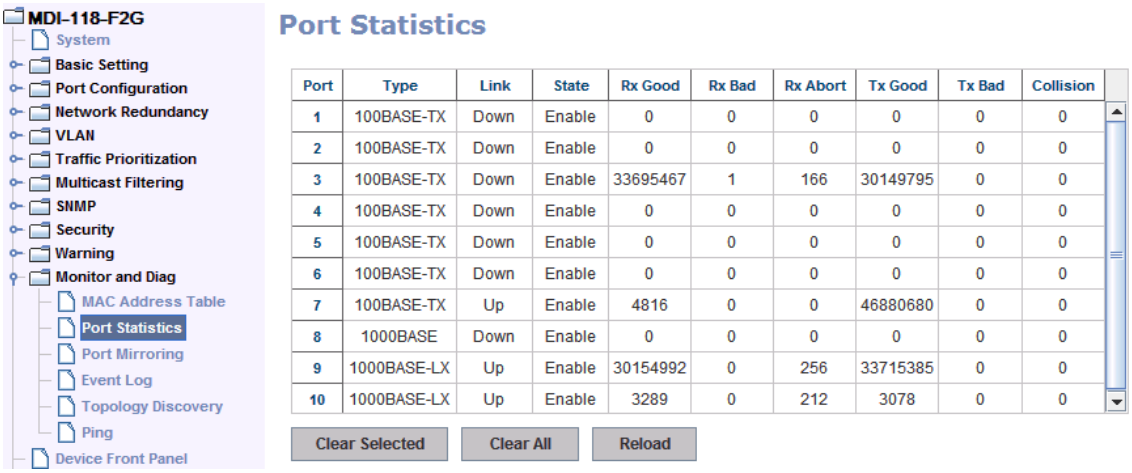
4.11.2 Port Statistics

In this page, you can view operation statistics for each port. The statistics that can be viewed include Link Type, Link State, Rx Good, Rx Bad, Rx Abort, Tx Good, Tx Bad and Collision. Rx means the received packet while Tx means the transmitted packets.

Note: If you see many Bad, Abort or Collision counts increased, that may mean your network cable is not connected well, the network performance of the port is poor…etc. Please check your network cable, Network Interface Card of the connected device, the network application, or reallocate the network traffic…etc.

Click on **Clear Selected** to reinitialize the counts of the selected ports, and **Clear All** to reinitialize the counts of all ports. Click on **Reload** to refresh the counts.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com


MDI-118-F2G
System
Basic Setting
Port Configuration
Network Redundancy
VLAN
Traffic Prioritization
Multicast Filtering
SNMP
Security
Warning
Monitor and Diag
MAC Address Table
Port Statistics
Port Mirroring
Event Log
Topology Discovery
Ping
Device Front Panel
Port Statistics
Port Type Link State Rx Good Rx Bad Rx Abort Tx Good Tx Bad Collision
1 100BASE-TX Down Enable 0 0 0 0 0 0
2 100BASE-TX Down Enable 0 0 0 0 0 0
3 100BASE-TX Down Enable 33695467 1 166 30149795 0 0
4 100BASE-TX Down Enable 0 0 0 0 0 0
5 100BASE-TX Down Enable 0 0 0 0 0 0
6 100BASE-TX Down Enable 0 0 0 0 0 0
7 100BASE-TX Up Enable 4816 0 0 46880680 0 0
8 1000BASE Down Enable 0 0 0 0 0 0
9 1000BASE-LX Up Enable 30154992 0 256 33715385 0 0
10 1000BASE-LX Up Enable 3289 0 212 3078 0 0
Clear Selected
Clear All
Reload

4.11.3 Port Mirroring

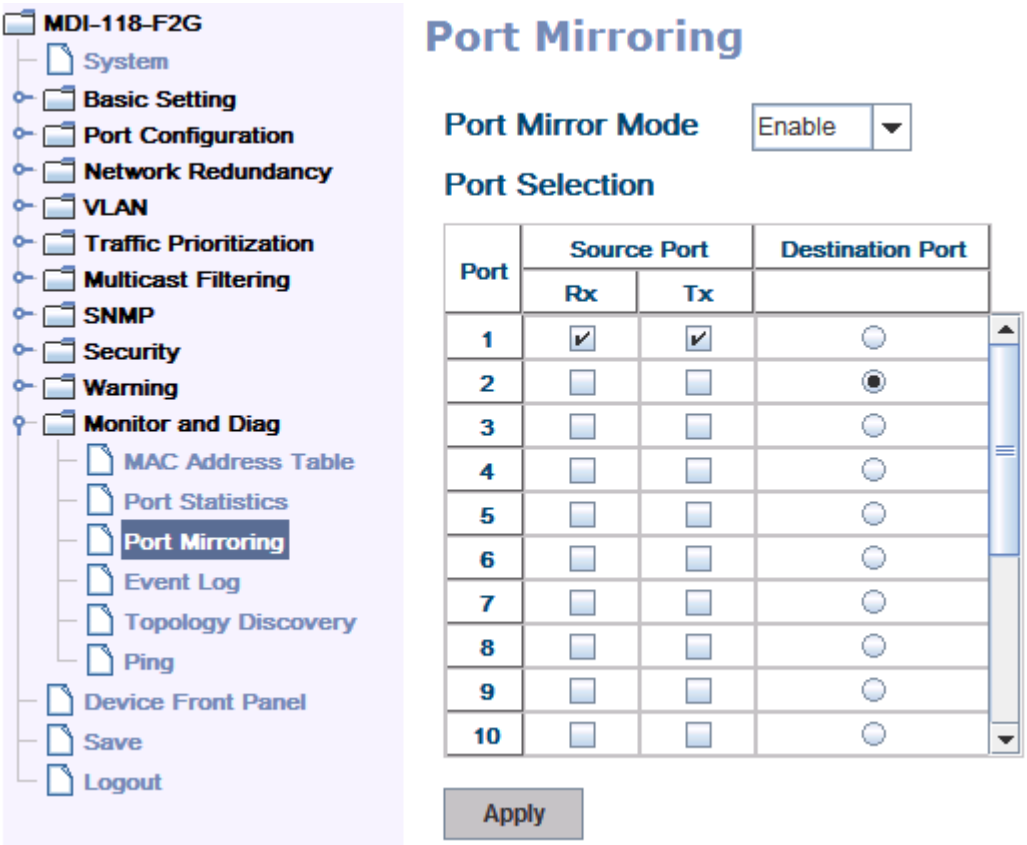
Port mirroring (also called port spanning) is a tool that allows you to mirror the traffic from one or more ports onto another port, without disrupting the flow of traffic on the original port. Any traffic that goes into or out of the Source Port(s) will be duplicated at the Destination Port. This traffic can then be analyzed at the Destination port using a monitoring device or application. A network administrator will typically utilize this tool for diagnostics, debugging, or fending off attacks.

Port Mirror Mode: Select Enable/Disable to enable/disable Port Mirror.

Source Port: This is also known as Monitor Port. These are the ports you want to monitor. The traffic of all source/monitor ports will be copied to destination/analysis ports. You can choose a single port, or any combination of ports, but you can only monitor them in Rx or TX only. Click on checkbox of the Port ID, RX, Tx or Both to select the source ports.

Destination Port: This is also known as Analysis Port. You can analyze the traffic of all the monitored ports at this port without affecting the flow of traffic on the port(s) being monitored. Only one of the destination ports can be selected. A network administrator would typically connect a LAN analyzer or Netxray device to this port.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

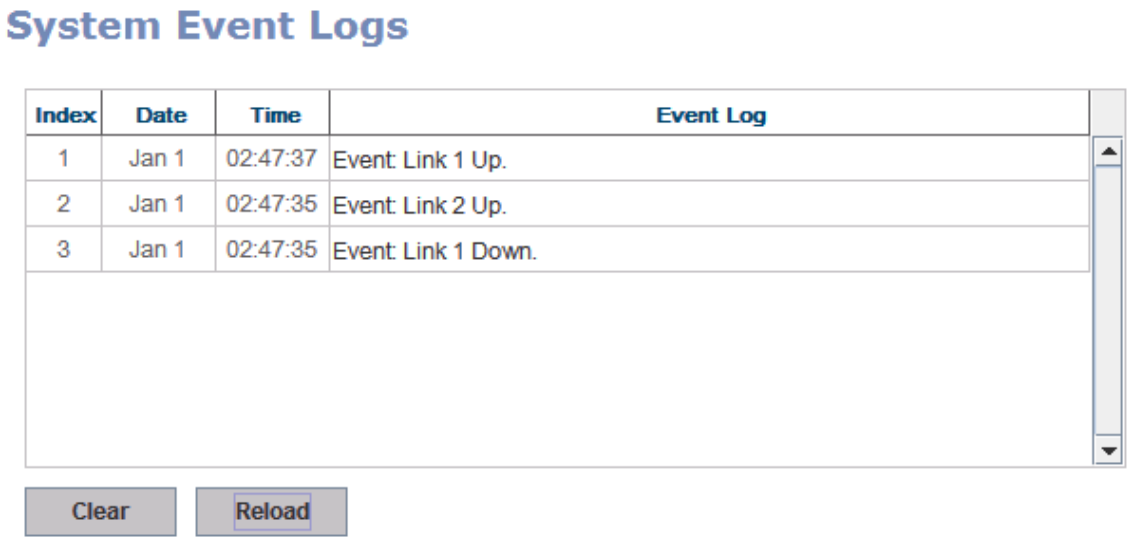


Once you finish configuring the settings, click on **Apply** to apply the settings.

4.11.4 Event Log

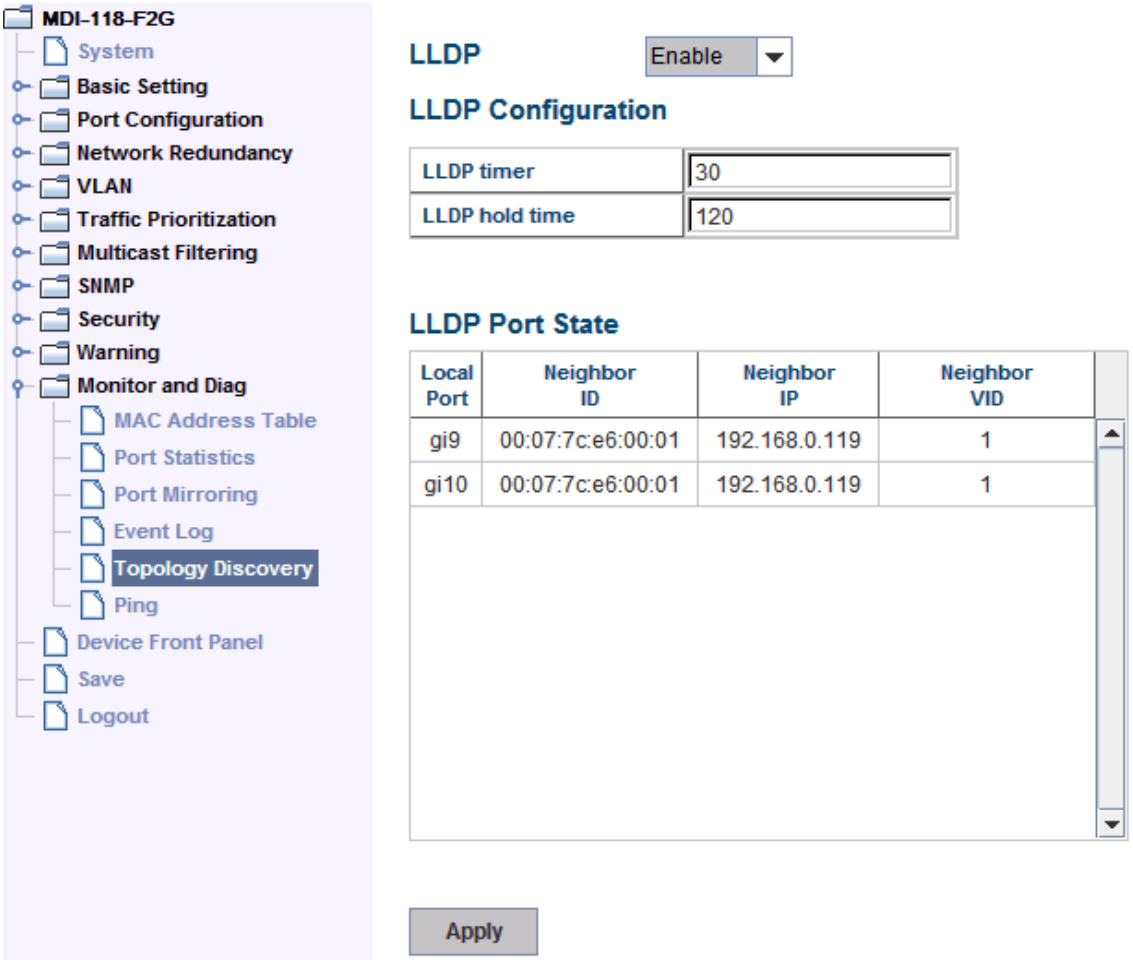
When System Log Local mode is selected, the switch will record occurred events in local log table. This page shows this log table. The entry includes the index, occurred data and time and content of the events.

Click on **Clear** to clear the entries. Click on **Reload** to refresh the table.



4.11.5 Topology Discovery

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com



The switch supports topology discovery or LLDP (IEEE 802.1AB Link Layer Discovery Protocol) function that can help user to discovery multi-vendor's network device on same segment by NMS system which supports LLDP function; With LLDP function, NMS can easier maintain the topology map, display port ID, port description, system description, VLAN ID… Once the link failure, the topology change events can be updated to the NMS as well. The LLDP Port State can display the neighbor ID and IP leant from the connected devices.

LLDP: Select Enable/Disable to enable/disable LLDP function.

LLDP Configuration: To configure the related timer of LLDP.

LLDP Timer: the interval time of each LLDP and counts in second; the valid number is from 5 to 254, default is 30 seconds.

LLDP Hold time: The TTL (Time To Live) timer. The LLDP state will be expired once the LLDP is not received by the hold time. The default is 120 seconds.

Local port: the current port number that linked with neighbor network device.

Neighbor ID: the MAC address of neighbor device on the same network segment.

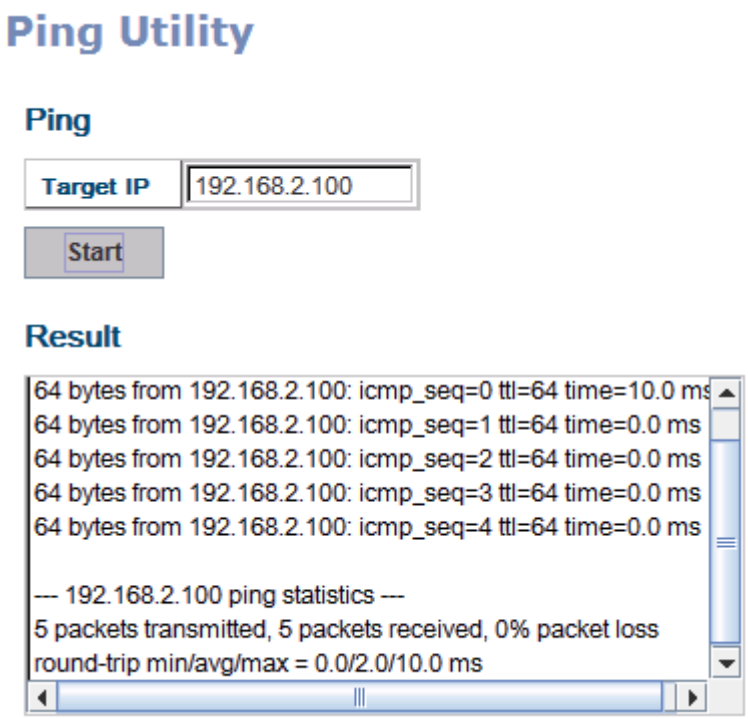
Neighbor IP: the IP address of neighbor device on the same network segment.

Neighbor VID: the VLAN ID of neightbor device on the same network segment.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.11.6 Ping Utility

This page provides **Ping Utility** for users to ping remote device and check whether the device is alive or not. Type **Target IP** address of the target device and click on **Start** to start the ping. After few seconds, you can see the result in the **Result** field.


Ping Utility
Ping
Target IP
192.168.2.100
Start
Result
64 bytes from 192.168.2.100: icmp_seq=0 ttl=64 time=10.0 ms
64 bytes from 192.168.2.100: icmp_seq=1 ttl=64 time=0.0 ms
64 bytes from 192.168.2.100: icmp_seq=2 ttl=64 time=0.0 ms
64 bytes from 192.168.2.100: icmp_seq=3 ttl=64 time=0.0 ms
64 bytes from 192.168.2.100: icmp_seq=4 ttl=64 time=0.0 ms
--- 192.168.2.100 ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 0.0/2.0/10.0 ms

4.11.7 CLI Commands of the Monitor and Diag

Command Lines of the Monitor and Diag configuration

Feature	Command Line
MAC Address Table	
Ageing Time	Switch(config)# mac-address-table aging-time 350 mac-address-table aging-time set ok! Note: 350 is the new ageing timeout value.
Add Static Unicast MAC address	Switch(config)# mac-address-table static 0007.7c01.0101 vlan 1 interface fastethernet7 mac-address-table ucast static set ok! **Note: rule: mac-address-table static**

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	MAC_address VLAN VID interface interface_name
Add Multicast MAC address	Switch(config)# mac-address-table multicast 0100.5e01.0101 vlan 1 interface fa6-7 Adds an entry in the multicast table ok! **Note: rule: mac-address-table multicast MAC_address VLAN VID interface_list interface_name/range**
Show MAC Address Table – All types	Switch# show mac-address-table ***** UNICAST MAC ADDRESS ***** Destination Address Address Type Vlan Destination Port ------------------ -------------- ------- ---------- 000f.b079.ca3b Dynamic 1 fa4 0007.7c01.0386 Dynamic 1 fa7 0007.7c10.0101 Static 1 fa7 0007.7c10.0102 Static 1 fa7 0007.7cff.0100 Management 1 ***** MULTICAST MAC ADDRESS ***** Vlan Mac Address COS Status Ports ---- -------------- ---- ------- ---------- 1 0100.5e40.0800 0 fa6 1 0100.5e7f.fffa 0 fa4,fa6
Show MAC Address Table – Dynamic Learnt MAC addresses	Switch# show mac-address-table dynamic Destination Address Address Type Vlan Destination Port ------------------ -------------- ------- ---------- 000f.b079.ca3b Dynamic 1 fa4 0007.7c01.0386 Dynamic 1 fa7
Show MAC Address Table – Multicast MAC addresses	Switch# show mac-address-table multicast Vlan Mac Address COS Status Ports ---- -------------- ---- ------- ----------

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	1 0100.5e40.0800 0 fa6-7 1 0100.5e7f.fffa 0 fa4,fa6-7
Show MAC Address Table – Static MAC addresses	Switch# show mac-address-table static Destination Address Address Type Vlan Destination Port ------------------ -------------- ------- ---------- 0007.7c10.0101 Static 1 fa7 0007.7c10.0102 Static 1 fa7
Show Aging timeout time	Switch# show mac-address-table aging-time the mac-address-table aging-time is 300 sec.
Port Statistics	
Port Statistics	Switch# show rmon statistics fa4 (select interface) Interface fastethernet4 is enable connected, which has Inbound: Good Octets: 178792, Bad Octets: 0 Unicast: 598, Broadcast: 1764, Multicast: 160 Pause: 0, Undersize: 0, Fragments: 0 Oversize: 0, Jabbers: 0, Disacrds: 0 Filtered: 0, RxError: 0, FCSError: 0 Outbound: Good Octets: 330500 Unicast: 602, Broadcast: 1, Multicast: 2261 Pause: 0, Deferred: 0, Collisions: 0 SingleCollision: 0, MultipleCollision: 0 ExcessiveCollision: 0, LateCollision: 0 Filtered: 0, FCSError: 0 Number of frames received and transmitted with a length of: 64: 2388, 65to127: 142, 128to255: 11 256to511: 64, 512to1023: 10, 1024toMaxSize: 42
Port Mirroring	
Enable Port Mirror	Switch(config)# mirror en Mirror set enable ok.
Disable Port Mirror	Switch(config)# mirror disable

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

	Mirror set disable ok.
Select Source Port	Switch(config)# mirror source fa1-2 both Received and transmitted traffic rx Received traffic tx Transmitted traffic Switch(config)# mirror source fa1-2 both Mirror source fa1-2 both set ok. **Note: Select source port list and TX/RX/Both mode.**
Select Destination Port	Switch(config)# mirror destination fa6 both Mirror destination fa6 both set ok
Display	Switch# show mirror Mirror Status : Enabled Ingress Monitor Destination Port : fa6 Egress Monitor Destination Port : fa6 Ingress Source Ports :fa1,fa2, Egress Source Ports :fa1,fa2,
Event Log	
Display	Switch# show event-log <1>Jan 1 02:50:47 snmpd[101]: Event: Link 4 Down. <2>Jan 1 02:50:50 snmpd[101]: Event: Link 5 Up. <3>Jan 1 02:50:51 snmpd[101]: Event: Link 5 Down. <4>Jan 1 02:50:53 snmpd[101]: Event: Link 4 Up.
Topology Discovery (LLDP)	
Enable LLDP	Switch(config)# lldp holdtime Specify the holdtime of LLDP in seconds run Enable LLDP timer Set the transmission frequency of LLDP in seconds Switch(config)# lldp run LLDP is enabled!
Change LLDP timer	Switch(config)# lldp holdtime <10-255> Valid range is 10~255 Switch(config)# lldp timer

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

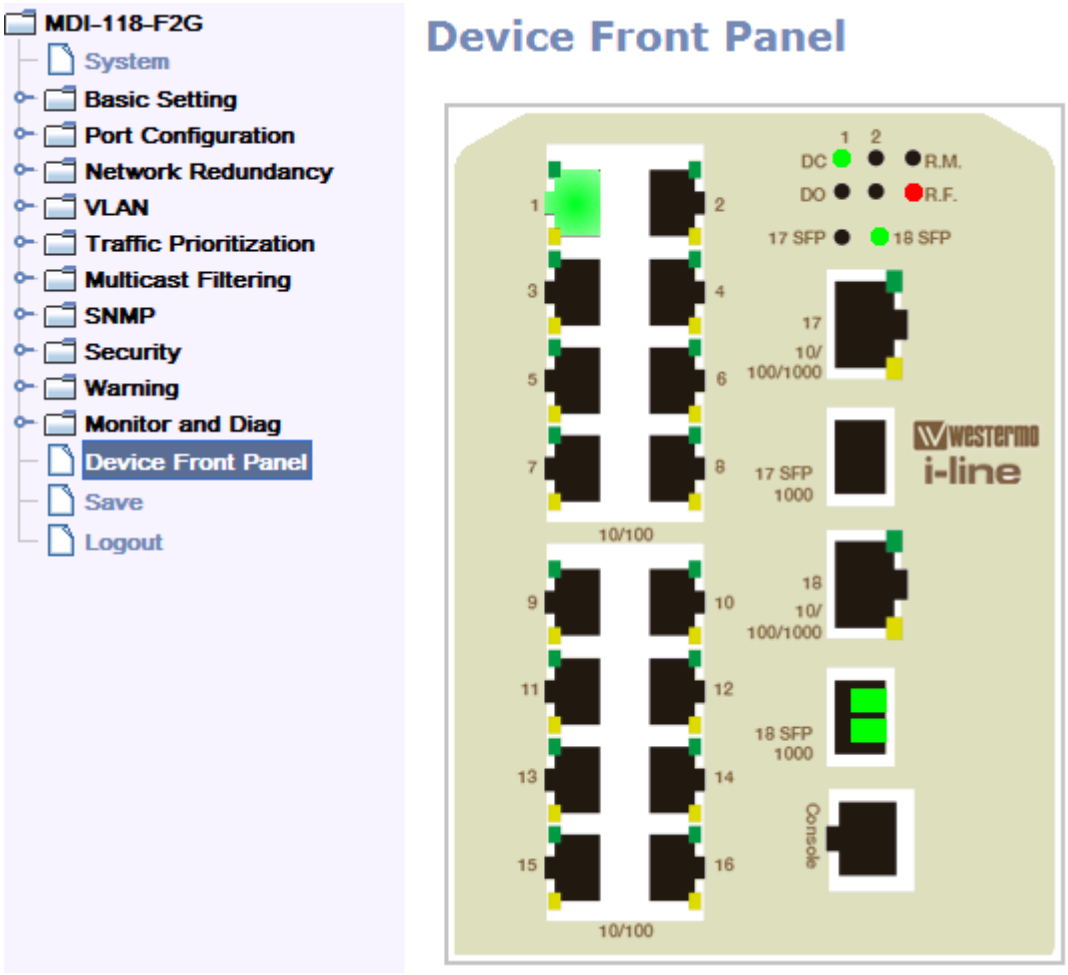
	<5-254> Valid range is 5~254
Ping	
Ping IP	Switch# ping 192.168.2.33 PING 192.168.2.33 (192.168.2.33): 56 data bytes 64 bytes from 192.168.2.33: icmp_seq=0 ttl=128 time=0.0 ms 64 bytes from 192.168.2.33: icmp_seq=1 ttl=128 time=0.0 ms 64 bytes from 192.168.2.33: icmp_seq=2 ttl=128 time=0.0 ms 64 bytes from 192.168.2.33: icmp_seq=3 ttl=128 time=0.0 ms 64 bytes from 192.168.2.33: icmp_seq=4 ttl=128 time=0.0 ms --- 192.168.2.33 ping statistics --- 5 packets transmitted, 5 packets received, 0% packet loss round-trip min/avg/max = 0.0/0.0/0.0 ms

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.12 Device Front Panel

Device Front Panel command allows you to see LED status of the switch. You can see LED and link status of the Power, DO, R.M. and Font Ports.

Feature	On / Link UP	Off / Link Down	Other
Power 1 (P1)	Green	Black	
Power 2 (P2)	Green	Black	
Digital Output 1(DO1)	Red	Black	
Digital Output 2(DO2)	Red	Black	
Ring Master(R.M.)	Green	Black	
Ring Fail(R.F.)	Red	Black	
Fast Ethernet	Green	Black	
Gigabit Ethernet	Green	Black	
SFP	Green	Black	Gray: Plugged but not link up yet.



Note: No CLI command for this feature.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.13 Save to Flash

Save Configuration allows you to save any configuration you just made to the Flash. Powering off the switch without clicking on **Save Configuration** will cause loss of new settings. After selecting **Save Configuration**, click on **Save to Flash** to save your new configuration.

Command Lines:

Feature	Command Line
Save	SWITCH# write Building Configuration… [OK] Switch# copy running-config startup-config Building Configuration... [OK]

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

4.14 Logout

The switch provides 2 logout methods. The web connection will be logged out if you don't input any command after 30 seconds. The Logout command allows you to manually logout the web connection. Click on **Yes** to logout, **No** to go back the configuration page.

Command Lines:

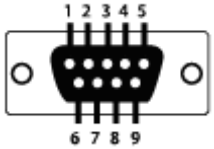
Feature	Command Line
Logout	SWITCH> exit SWITCH# exit

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

5 Appendix

5.1 Pin Assignment of the RS-232 Console Cable

The total cable length is 150cm.



RJ45 Pin	DB9 Pin
1	7
2	9
3	4
4	5
5	1
6	3
7	2
8	8

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

5.2 Private MIB

The private MIB can be found in product CD. Compile the private MIB file by your SNMP tool. The private MIB tree is the same as the web tree. This is easier to understand and use. If you are not familiar with standard MIB, you can directly use private MIB to manage /monitor the switch, no need to learn or find where the OIDs of the commands are.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

5.3 Revision History

Edition	Date	Modifications
V0.1	2010/10/28	The first version

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com

Westermo Teleindustri AB • SE-640 40 Stora Sundby, Sweden
Phone +46 16 42 80 00 Fax +46 16 42 80 01
E-mail: info@westermo.se
Westermo Web site: www.westermo.com

Subsidiaries

Westermo Data Communications AB
Svalgången 1
SE-724 81 Västerås
Phone: +46 (0)21 548 08 00 • Fax: +46 (0)21 35 18 50
info.sverige@westermo.se

Westermo Data Communications Ltd
Talisman Business Centre • Duncan Road
Park Gate, Southampton • SO31 7GA
Phone: +44(0)1489 580-585 • Fax.:+44(0)1489 580586
E-Mail: sales@westermo.co.uk

Westermo Data Communications GmbH
Goethestraße 67, 68753 Waghäusel
Tel.: +49(0)7254-95400-0 • Fax.:+49(0)7254-95400-9
E-Mail: info@westermo.de

Westermo Data Communications S.A.R.L.
9 Chemin de Chilly 91160 CHAMPLAN
Tél : +33 1 69 10 21 00 • Fax : +33 1 69 10 21 01
E-mail : infos@westermo.fr

Westermo Data Communications Pte Ltd
2 Soon Wing Road #08-05
Soon Wing Industrial Building
Singapore 347893
Phone +65 6743 9801 • Fax +65 6745 0670
E-Mail: sales@westermo.com.sg

Westermo Teleindustri AB have distributors in several countries, contact us for further information.

Proudly Distributed by Gross Automation | (877) 268-3700
www.westermosales.com | sales@grossautomation.com